THE IRON AGE

New York, Thursday, June 14, 1906.

A German Cold Rolling Mill.

Cold rolling mills and steel rolls are specialties of the Walzmaschinen-fabrik, August Schmitz, Düsseldorf, Germany. The rolls are hardened cast steel and are made in various sizes. The smallest mill, known as D-2, has rolls 4 inches in diameter by 5 inches wide, and the largest rolls 8 inches in diameter by 9 inches wide. The illustrations are of a middle size, D 4, having rolls 6 inches in diameter by 7 inches wide. A view of the mill from the side at which the stock enters is given in Fig. 1, and Fig. 2 shows a view of the opposite side.

In Fig. 2 it is especially to be noticed that the drive has been compactly arranged, the tight and loose pulleys being mounted on brackets cast on the frame and the pulleys partly recessed into the frame. Manipulating either of the two levers shown at the near end in Fig. 2 shifts the belt for starting and stopping. In the latter operation when the belt is shifted to the loose pulley a brake is simultaneously applied to the tight pulley to stop the machine quickly.

The shaft to which the tight pulley is secured carries at its end a pinion meshing with a large gear on the shaft of the lower roll. The ratio of gear reduction is about 1 to 7.

The two short housings near the large gear contain the bearings for the driving sections of the rolls which are geared together with pinions within the casing between the housings. From these housings to the adjacent housings in which the rolls are journaled are universal connections for allowing vertical adjustment of the upper roll. The inner ends of the driving shafts have square ends fitting loosely in square holes in sleeves, which are connected by short square shafts with similar sleeves fitting loosely on the square ends of the rolls. The lower roll is journaled in stationary bearings and the upper roll has boxes which are vertically adjustable, the downward tension on these being regulated by screws with hand levers at the top. To hold the rolls normally apart there are springs between the boxes of the upper and lower rolls, which may be distinguished in the view given in Fig. 2.

The rolls are hollow and are arranged for water cooling, the connections for which may be seen in Fig. 2. The water passes first through the upper roll and is then conducted to the lower roll by a short section of flexible hose. In the illustration may be seen the fixtures for maintaining tight joints between the hose and the revolving rolls. Short arms extending out from the outside housings support yokes, intermediate between which and the ends of the hose are springs for keeping the ground ball and socket joints between the hose and the rolls in contact.

The passage of the material through the machine may best be followed by referring to Fig. 1. The stock is placed upon the reel shown at the left, which it will be observed is adjustable to any position vertical, horizontal or at an angle to best accommodate the material and its most advantageous introduction into the machine. The strip first passes between wooden blocks under the clamp mounted on the extension bracket in front of the rolls. The wooden blocks are faced with cloth or some substance to clean the strip during its passage and the clamp is tightened sufficiently to put a tension on the strip and regulate the rate at which it is drawn in by the rolls. The strip from the clamp passes between guides immediately in front of the rolls and then between the rolls where it receives a reduction in thickness.

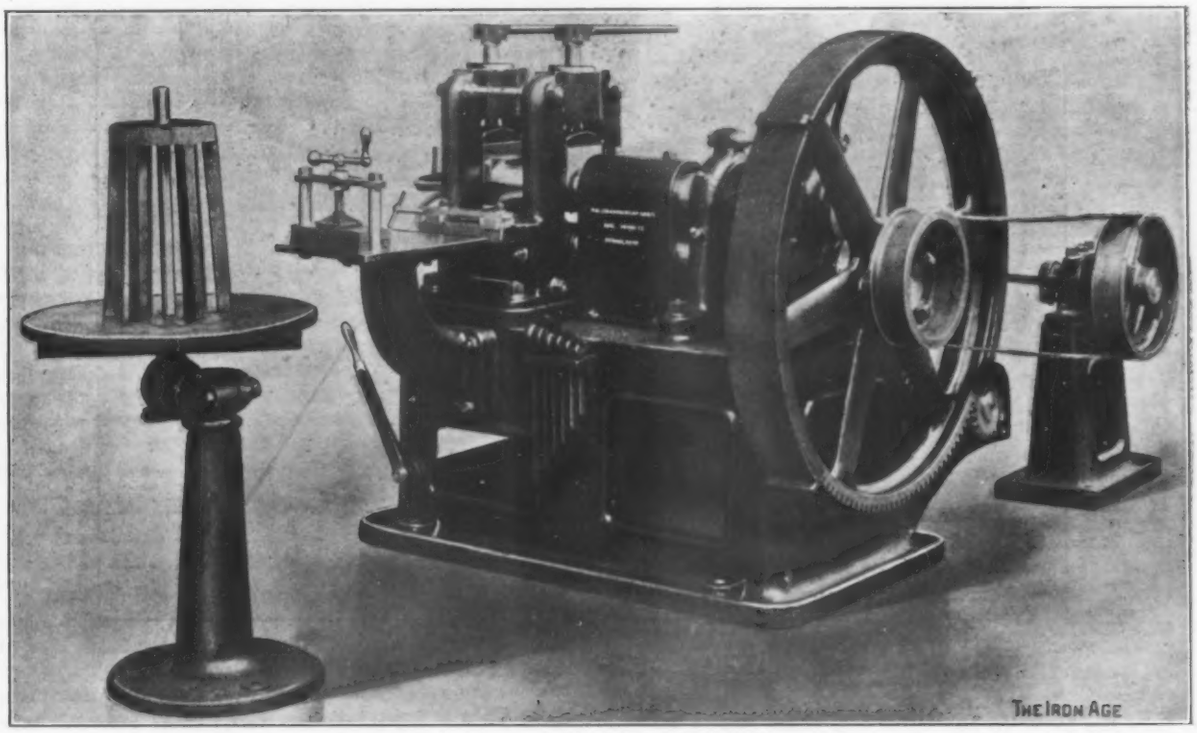


Fig. 1.—A 6 x 7 Inch Cold Rolling Mill Built at the Walzmaschinen-fabrik August Schmitz, Düsseldorf, Germany.

Issuing from the other side of the machine the strip is coiled on a reel the drive of which may be seen in Fig. 1. The reel tends to run faster than the material comes from the rolls, so that a tension is exerted coiling the strip very tightly, and the excess speed is lost in the slipping of the belt.

The reeling drum is an interesting device and is made expansible, being set at its largest circumference when about to reel on the stock. After the material is coiled on the drum the drum is contracted, allowing the coil to be removed easily. The essential features of the drum

are four quarter sections loosely connected to a flanged plate which is in one piece with a hub on the shaft. Mounted on this hub is a slidable cone the outer surface of which is tapered to correspond to an internal taper on the four segments of the drum. When the cone is slightly withdrawn it allows the segments to contract, and when the drum is expanded by pushing the cone back a turn of a clamping handle locks it in position, holding the drum expanded. Ordinarily the tension of the coiled strip is sufficient to force the cone out when the clamp is released so that the drum is immediately contracted.

Many of the parts of the mill have been made of steel castings where formerly cast iron was used. The result has been a saving in weight and a reduction in the size of parts, making the mill much more compact than formerly, while equally as strong if not stronger. The parts which are now of cast steel are the housings of the rolls, the large gear and the connections between the rolls. All gears are cut from the solid, and all bearings are ring oiling. The pinions transmitting the drive from the lower to the upper roll shaft run in oil and have staggered teeth, taking the place of the helical or herring bone teeth which are often used, but which it is difficult to cut. The staggered-tooth pinion accomplishes the same object, which is to avoid non-uniformity in the rolled material consequent upon irregular rotation. The pinions are made in two parts and are pinned together to hold their teeth in staggered relation and are keyed to the shaft with two keys each.

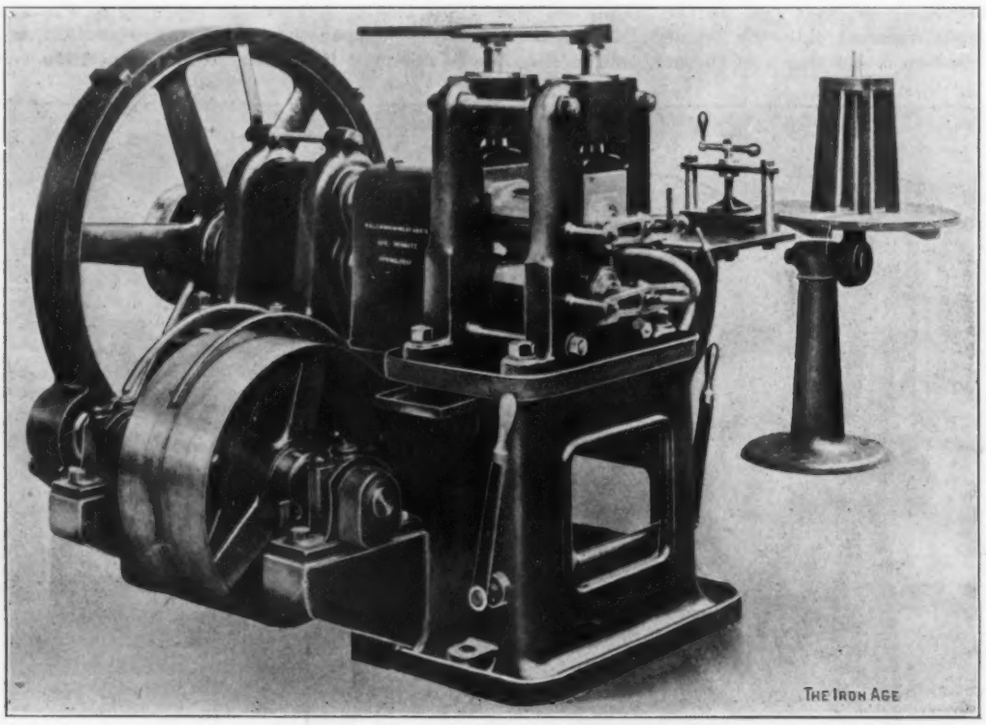


Fig. 2.—View of the Opposite Side of the August Schmitz Cold Rolling Mill.

The rolls are designed to run at a speed of about 35 revolutions per minute, which requires a driving pulley speed of about 245 revolutions per minute. The following are the dimensions of the five standard sizes in which the cold rolling mills are made: Size D-2 contains 4 x 5 inch rolls, weighs 3530 pounds and occupies, including the winding and unwinding reels, 47 x 108 inches; size D-3 has 5 x 6 inch rolls, weighs 4200 pounds and occupies a floor space of 59 x 118 inches; size D-4 has 6 x 7 inch rolls, weighs 5100 pounds and occupies a floor space of 65 x 106 inches; size D-6 has 7 x 7 inch rolls, weighing 7000 pounds and occupies 67 x 142 inches, and size D-7 has 8 x 9 inch rolls, weighs 7500 pounds and occupies a floor space of 71 x 142 inches. The smallest machine, D-2, will roll strips 1-32 inch thick and 1½ inches wide, size D 3 takes stock 3-64 inch thick and 2¾ inches wide, D-4 takes stock 5-64 inch thick, 3½ to 4 inches wide, D-6 takes stock ⅛ inch thick and 4 inches wide, D-7 takes stock 5-32 inch thick, 5 to 6 inches wide. Experience has shown that machines D-3 and D-4 are most successful in rolling material down to the thinnest gauges, for example 1-1000 inch thick.

San Francisco and European Exports of Iron and Steel.

San Francisco apparently will be credited for some time with any movement out of the ordinary in the iron trade of Europe. The recent purchases of pig iron in England by German works, which have given an improved tone to the British market, were attributed in some quarters to the demand for material coming from San Francisco contractors. The London *Statist* of May 26 says, in reviewing the British export trade in iron and steel:

A feature of the last week or two has been the receipt of quite a number of orders for structural steel for shipment to South America and to the Far East. There have also been transferred to England and Scotland some considerable orders for black sheets which ought to have been shipped from Germany. The inference is drawn that many of the export orders for structural steel have also been transferred from Germany, and the supposition is that Germany has contracted to send so much steel to San Francisco within a limited time that she is purchasing from us to cover some of her other export trade. This is mere surmise in the meantime, but it finds some support from the fact that there are inquiries in the freight market for steamers to carry 40,000 tons of material from Hamburg, Rotterdam and Antwerp to 'Frisco. German merchants who have sold in the East and elsewhere probably find that they can get quicker delivery from British makers than in Germany. At the same time it is not improbable that American contractors for San Francisco building may have covered themselves to a large extent in Germany and will order forward the stuff when they see that American makers cannot deliver quickly enough.

As was the case a few weeks ago, it cannot be ascertained that foreign steel makers have secured any orders of moment in San Francisco for the reconstruction of buildings. In no line is the demand such that American works cannot take care of it. The fact is that the German iron trade is unusually strong on its own account and that consumption of iron and steel in all countries is drawing in an unprecedented way upon German and British works. The predictions of worldwide activity following the conclusion of peace by Russia and Japan seem at last to be in process of fulfillment.

An Economical Electric Ore Hoist.

Following is an extract from the president's annual address, delivered before the Montana Society of Engineers, by Ernest W. King:

In hoisting ore with an electric hoist, owing to the great variation in power used, it has been impossible to contract for electrical power at anything within reason. For instance, one of the large plants in Butte, using a 2000 horse-power hoist, requires not over 300 horse-power running continuously for the actual load, yet it would be necessary to pay for the whole 2000 horse-power if it was bought from any of the power companies. This is being overcome now by using a motor generator set, of which the General Electric Company is now installing several in Mexico at El Oro for the Mexican Light & Power Company, and will probably also install two plants in Butte in the near future, one for the M. O. P. Company and one for the Butte Copper & Zinc Company at the Emma mine.

A slow speed, direct current motor is either geared or directly connected to the hoisting drum and receives current from a direct current generator driven by a motor. The motor generator runs at high speed and carries a fly wheel, which is of sufficient capacity to operate the hoist for one continuous trip without any power being supplied from the system. The object of the fly wheel is to store up power during nine-tenths of the time that the hoist is idle and to give it out during the few seconds the hoist requires it. The result is that the power drawn from the supply system is practically constant and the wide fluctuations in current are confined to the connections between the hoisting motor and the generator. The power drawn from the system is therefore only a fraction of that required to start the hoist.

The system of control is by regulating the field of the generator and therefore the voltage supplied to the motor on the hoist. This means that only 1 or 2 per cent. of the power current passes through the controller, which makes it a much more easily handled piece of machinery, and the speed of the hoist can be controlled from full speed to just barely moving. The cost of the motor generator set, fly wheel and motor on the hoist is only about 50 per cent. greater than that of an induction motor connected direct to the hoist, so that the extra cost of installing is as nothing compared to the cost of power that would be saved by the new method.

Iron and Shipbuilding in Scotland.

GLASGOW, June 1, 1906.—While the expected has not come to the iron trade here, the unexpected has. That is to say, we have not received the large orders for pig iron or steel for San Francisco that some sanguine souls predicted, but we have received a great many orders from Germany that the market generally was not looking for. Whether or not Germany has actually sold finished material to America, she is certainly buying largely crude material here. The shipments have been so large that the warrant stock of Cleveland No. 3 has been drawn on and reduced under 640,000 tons. It is not, however, Germany alone that has been buying, for a good deal has been going to other parts of the continent as well, and Scotland is now taking more Cleveland iron than last year. Experienced dealers predict that the present export demand for pig iron will continue for some months. Perhaps once more the wish is father to the thought, but the shipments in May have reached a record total.

Steel makers and iron manufacturers are not buying crude material as freely as they were. But that both trades have been doing well is shown by the awards of the arbitrators under the respective conciliation boards, who have just conceded to the iron workers in Scotland an advance of 2½ per cent. in wages, and in the north of England 3 pence per ton on puddling and 2½ per cent. on mill wages, as the result of the higher net prices realized during the months of March and April. These are the second advances to the like amount this year. The price of ferromanganese, however, has just been reduced £2 per ton, making the quotation for 80 per cent. now £14 per ton, which does not look so lively.

Steel plate makers here are still busy on contracts and have enough work on hand to keep them busy for some time, but they are not booking many new orders. Angle makers are not only sufferers from want of specifications, but the Scotch and English makers are worrying each in their respective districts. English makers, for instance, offer angles here cheaper than the Scotch makers are willing to sell at, and the latter retaliate by undercutting in the north of England. This is poor business, but negotiations are now in progress for a working agreement, similar to that which exists among the plate makers, to avoid senseless competition.

In the bar iron trade there is a fair business doing, one of the features of which consists of demands from Canada. This branch of our industries is benefiting by the activity in Germany and Belgium, which prevents the makers in these countries from undercutting in our markets as they have been doing. Moreover, a good many English exporters who have been in the habit of placing their orders on the continent at low figures are now compelled to turn their attention here because Belgian and German quotations are no longer tempting and deliveries are slow.

Cast iron pipe makers are now better employed, having booked some good orders recently. There is an inquiry for 8000 tons of pipes for South America, said to have come here because makers in the United States are too busy to face it. Makers of railroad material and rolling stock are now well contracted, and the Scotch nail makers have just advanced their prices 5 shillings per ton for all descriptions of cut steel nails. There is also a good deal doing in boiler plant.

While the report comes from America that a quantity of steel ship plates has been sold for a British shipyard, nothing is known of the transaction here, nor is it believed in. But an order has been received from America for a cargo of foundry iron to be shipped from the tees to an Atlantic port for pipe making purposes for export. Such a transaction, however, has no market-significance. We have inquiries from Canada for basic pig iron, said to be for rail making. The quantity named is 150,000 tons, to be delivered over three years, but both quantity and delivery are doubtful, though that Canada will buy a considerable quantity of pig iron from us this season is tolerably certain.

The end of the fifth month of the commercial year finds us with a record production in shipbuilding. The total output from all the Scotch shipyards in May was 55,148 tons, and in the five months ending May was 232,420 tons. This exceeds all previous records of the first five months, the nearest to it having been 217,750 tons in the first five months of 1899.

The Philadelphia Foundrymen's Association.

The one hundred and fifty-eighth regular meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club June 6. Owing to the fact that many of the members were in attendance at the annual convention of the American Foundrymen's Association in Cleveland, the number present was small. H. O. Evans occupied the chair. The treasurer's report showed a very satisfactory financial condition of the association, there being a balance amounting to $2,339.72 on hand, with no outstanding indebtedness. The application of the E. H. Mumford Company, manufacturer of foundry molding machines, represented by E. H. Mumford, for membership in the association was favorably acted upon, the ballot being unanimous. There was no regular paper before the association at this meeting. An informal discussion on the subject of tramp or floating labor in the foundry followed the business meeting.

The new Cunard Line steamer Lusitania, the world's largest liner, was successfully launched at Glasgow, Scotland, June 7. The vessel is 790 feet long, its greatest breadth is 88 feet, and its displacement is about 40,000 tons. Turbine engines will drive it at an expected speed of 24 to 25 knots.

The Ernst Wiener Company's New Shops.

The new shops of the Ernst Wiener Company are devoted to the manufacture of industrial railroad equipment of every description for mines, quarries, contractors, plantations, brickyards and manufacturing plants. The aggregate floor area exceeds three acres, and the location of the buildings upon a 12-acre lot provides for liberal future expansion. In erecting the new additions to this plant great care was taken to make the design and equipment up to date in every particular. The location at Youngstown, Ohio, favors the obtaining of raw material at a low cost, being within a short distance of its source. The shops have a frontage of 600 feet on the yards of the Pennsylvania, Baltimore & Ohio, Pittsburgh & Lake Erie and the Erie railroads, providing excellent facilities for shipping product. In addition to these railroads the Lake Shore & Michigan Southern and Youngstown & Southern center at this point.

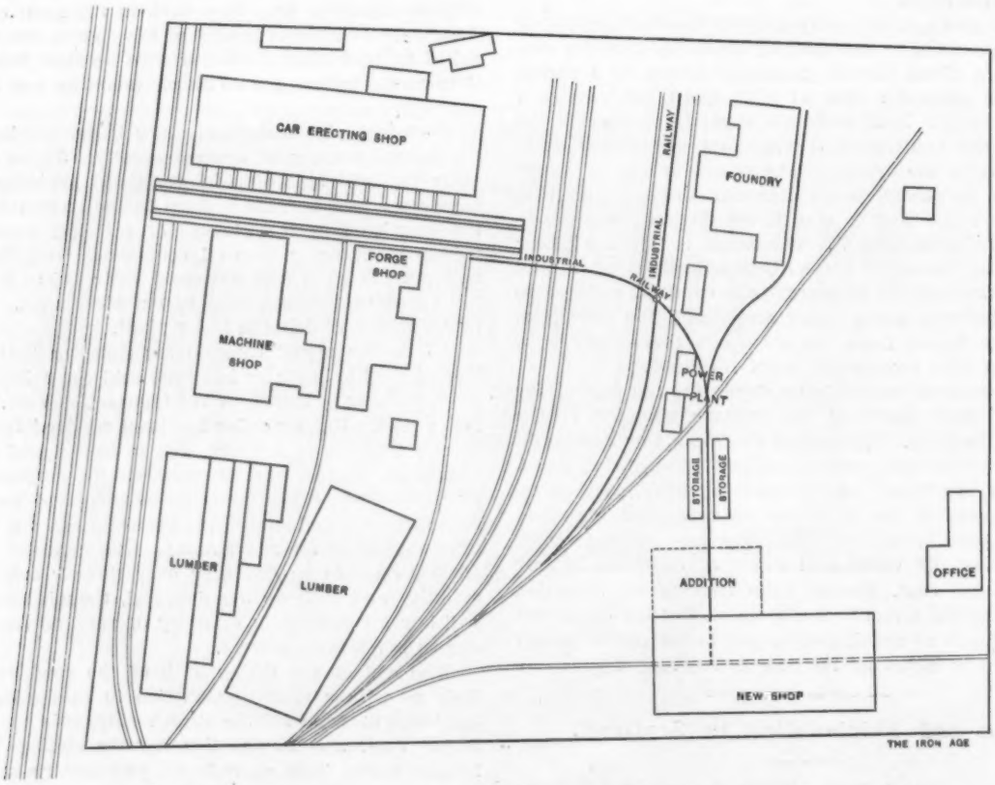


Fig. 1.—Plan of the Ernst Wiener Company's Shops at Youngstown, Ohio.

Fig. 1 shows the location of the principal buildings. These comprise a new shop, 80 x 200 feet; car erecting shop, 80 x 270 feet; wood working shop, 80 x 60 feet; foundry, 60 x 110 feet, and a machine shop, 60 x 160 feet, besides numerous small buildings used for storage purposes. Throughout the plant the transportation of raw material has been well worked out. Spur tracks from the yards of the railroads run into the grounds and branch out into nine sidings reaching to all the principal shops, one of them leading into and extending the full length of the machine shop. Besides these standard gauge tracks there is provided an interworks railway system connecting the machine shop, foundry, car erecting shop, &c.

The buildings are of brick and steel construction. In the new shop steel girders and columns divide the wall into ten panels, each containing six large windows. This shop, an interior view in which is given in Fig. 2, being the newest, is of most interest. It is exceedingly well lighted, and, there being no overhead shafting, a clear headway is provided throughout the entire central portion of the building. The floor is of 4-inch yellow pine laid on slag filling, each machine, however, being provided with a special foundation of concrete. The roof is supported on ten steel trusses, and is covered with asphalt roofing. A skylight runs the entire length of the building, and the windows face east and west. Along the east side is a gallery, under which the smaller machine tools are located, being driven by the only line shaft in the shop. This shaft is driven by a 20 horse-power Westinghouse electric motor and drives nine machines, including two boring mills for large car wheels, two 20-inch lathes, shapers, radial drills and other small machine tools. All other machines in the shop have individual electric motors. Among the more important are a 60-ton hydraulic ram, driven by a 3½ horse-power motor; one special axle lathe, driven by an 11½ horse-power motor; two Pels punches, driven by 4 horse-power motors; one punch, driven by a 7½ horse-power motor; one cold saw, chain driven by a 5 horse-power motor; one combination punch and shear, besides numerous lathes, shears, riveters, small punches and other small tools.

In the southeast corner of the shop is an Ingersoll-Rand air compressor having a displacement capacity of 250 cubic feet of free air per minute when operating at 180 revolutions per minute. This compressor is gear driven by a Westinghouse 50 horse-power motor, controlled by a Cutler-Hammer self starter. Air is stored in a 40-inch by 10-foot receiver located in a pit near the compressor. From the receiver a 4-inch main air pipe extends underneath the floor the entire length of the building, providing numerous 1-inch outlets to which pneumatic tools may be connected. These tools form an important part of the shop's equipment, since there is a great deal of riveting and chipping done, as almost all the small steel cars are constructed of steel plates riveted together.

A 5-ton electric crane operates along a central craneway 80 feet wide. This crane has a lift of 24 feet and has two 25 horse-power motors for the hoist and trolley travel and a 2 horse-power motor for the bridge travel. At each end of this shop there are large double doors, permitting the entrance of freight cars. Along the west side there are two smaller doors, through which a works railway leads to the other shops of the plant. As a rule, rough castings are received at the north end of the shop and finished product is shipped from the south end. The material manufactured in this shop consists entirely of steel cars and metal parts.

Wooden cars are erected in a large building situated

at quite a distance from the new shop and forming one of a group of buildings which comprise the older part of the plant. It is 270 feet long by 80 feet wide and contains 16 standard gauge tracks running crosswise of the building and having a capacity for assembling 32 standard gauge cars at a time. A transfer table operates

Fig. 2.—An Interior View in the New Steel Car Shop.

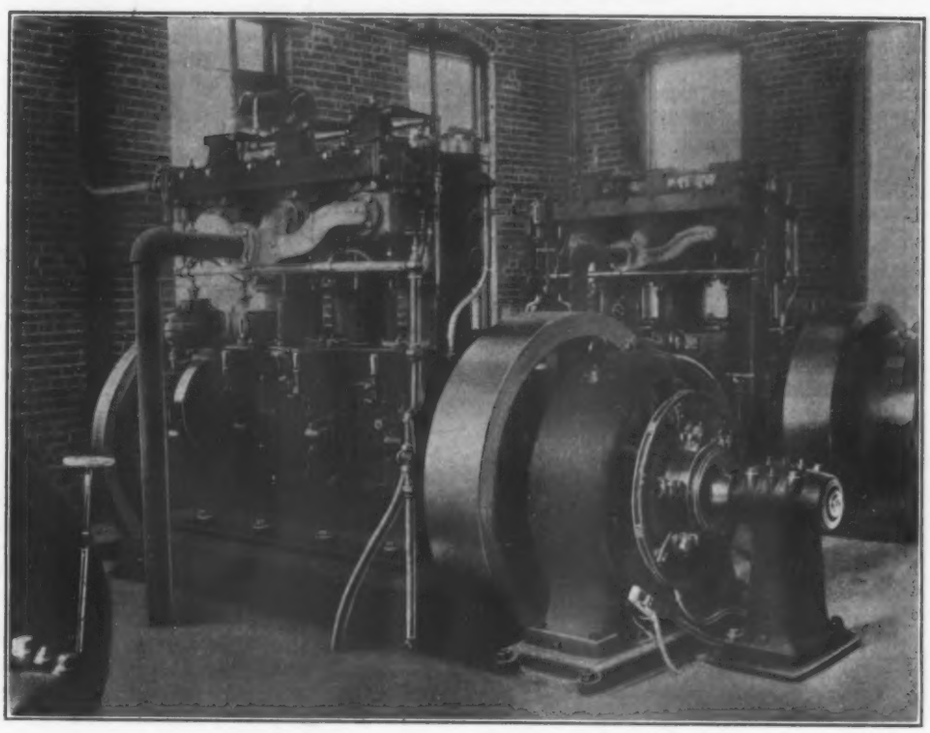


Fig. 3.—Two of the Units in the Power Plant.

alongside this shop in a pit 350 feet long by 30 feet wide, and is used for conducting the various sections, such as trucks and frames, from the other shops to the erecting shop. Across the transfer table from this shop are located the wood working and forge shops.

These shops are well provided with machine tools, driven in groups from shafting operated by 25 and 50 horse-power electric motors. The forge shop contains seven forges operated by compressed air under 25 pounds pressure. It also contains steam hammers, a bulldozer, a gang drill, numerous small drill presses, bolt threading machines and automatic bolt and nut machines. Bar iron is stacked just outside the building and large steam engine driven shears are provided for cutting stock. Back of this group of buildings is a large lumber yard containing 1,000,000 cubic feet of lumber, which is kept on hand for stock purposes.

The foundry, situated north of this group of buildings, is 60 x 110 feet, and is used for casting car wheels, brake shoes, fixtures and other parts used in car con-

struction. It is well lighted and provided with molding machines and machine tools driven by a 20 horse-power electric motor. Fuel and iron are carried to the charging floor by a hydraulic elevator of 1 ton capacity and having a platform 6 x 6 feet. This foundry is one of the older buildings, but it is the intention to bring it up to date in every particular. Pneumatic sand rammers, chipping hammers and other improved apparatus will very shortly be installed.

Motive power for the entire works is generated in a power house, 30 x 40 feet in size, containing three 85 horse-power Westinghouse gas engines direct connected to 57½-kw. electric generators. Two of these units may be seen in Fig. 3. This installation provides an exceedingly economical source of power for the works. The engines are run by natural gas possessing a calorific value of 1000 British thermal units per cubic foot and costing but 28 cents per 1000 feet. As the engines consume only 10½ cubic feet per horse-power hour, the cost of fuel is only 0.3 cent per horse-power hour. The engines thus far have been running night and day and have operated most satisfactorily. Cooling water for the jackets is obtained from a cooling pit having a capacity for 38,000 gallons, and is circulated by means of a centrifugal pump. The engines are supported on concrete foundations 5 feet deep. The total weight on each foundation is 36,000 pounds. A current of 220 volts is used for both power and lighting.

A general office building, situated at the entrance to the grounds, contains the office of the superintendent, a drafting room library and a room for making blue prints by the Wagenhorst automatic electric process. All buildings are provided with fire extinguishing apparatus. Water mains supply water under 60 pounds pressure to numerous hose boxes, beside which fire pails and extinguishers are placed at convenient points.

The Northwestern Iron Company.

A statement concerning the properties and operations of the Northwestern Iron Company, Milwaukee, Wis., is contained in a circular recently issued in connection with the offering by Chicago bankers of $400,000 5 per cent gold bonds of the company. The bonds are secured by mortgage on all the property of the company, including 386 acres of iron ore lands in Dodge County Wis., limestone quarries and two blast furnaces, with an annual capacity of 165,000 tons, at Mayville, Wis., 55 miles west of Milwaukee. The total valuation of the property is $1,834,000—namely: Furnace A, land, tracks, houses, &c., $500,000; furnace B, under construction, to cost approximately $450,000; iron ore lands, mines and limestone quarries, $750,000; cash and cash assets, $134,000. The trust deed requires the company, on and after January 1, 1907, to keep its working capital at or over $200,000, and also provides for the payment to the trustee of $1 per ton for every ton of ore in excess of 150,000 tons taken from the company's lands in any year. A letter of President Irving M. Bean, January 9, 1906, contains the following statement in substance:

Incorporated in February, 1854, but had been producing pig iron for some years previously; one of the oldest established furnaces in the United States. Has had a successful history, due in no small measure to its ownership of a deposit of iron ore within four miles of the furnace, now costing not exceeding 50 cents per ton delivered at the furnace. For many years we have operated on our 68-acre tract, but we recently purchased other tracts comprising several hundred acres. We have demonstrated that in our 68 acres we have at least 1,000,000 tons of ore in sight. On the remaining acreage we are convinced we have upward of 4,000,000 tons of ore, or enough for our two furnaces for upward of 100 years. We also own our limestone quarries, and have made satisfactory contracts for a supply of coke from the by-product coke ovens at Milwaukee, within 55 miles of the furnace. For some time past our company has paid dividends of 10 per cent. per annum, and it has accumulated a surplus. Some years ago we remodeled the furnace as an up to date coke furnace. The ever increasing demand has led us to erect a second furnace with larger and more modern equipment, at an estimated cost of over $450,000, to be met in part from the proceeds of these bonds. Construction is now actively under way, in charge of Julian Kennedy of Pittsburgh. The orders booked insure a profitable year in 1906, and we feel confident that under all conditions we can earn a minimum average of $1 per ton net profit upon all iron we produce.

Developments in Canada.

Electric Smelting.

TORONTO, June 9, 1906.—Dr. Haanel, Dominion Superintendent of Mines, has put in the hands of the Minister of the Interior his preliminary report of the experiments made in the electric smelting of iron ores at Sault Ste. Marie. These experiments, it will be remembered, were carried on under an arrangement with the Government. Dr. Haanel, an official of the Government, presided over them; the cost of them was wholly or partly paid by an appropriation voted by Parliament; if proved successful Dr. Héroult, the inventor and owner of the process, was to have certain rights in Canada. It is to be added that the Lake Superior Corporation supplied the power for the experiment without charge.

In this preliminary report Dr. Haanel says nothing as to the feasibility or economy of producing steel by the process, though at the conclusion of the experiments it was given out that the results in this particular were extremely satisfactory. Possibly that aspect of the matter will be dealt with in the fuller presentation that must be expected to follow a report that is described as "preliminary." In this report the following conclusions are set forth:

That magnetite can be as economically smelted by electrothermic process as hematite; that ores of high sulphur content not containing manganese can be made into pig iron containing only a few thousandths of 1 per cent. of sulphur; that the silicon content can be varied as required for the class of pig to be produced; that charcoal, which can be cheaply produced from mill refuse or wood that could not otherwise be utilized, can be substituted for coke as a reducing agent without being briquetted with the ore; that a ferro-nickel pig can be produced practically free from sulphur and of fine quality from roasted nickeliferous pyrrhotite; that titaniferous iron ores up to perhaps 5 per cent. titanic acid can be successfully treated by the electric process; that pig iron can be produced for $10.69 per ton; that a 10,000 horse-power plant to make 120 tons of pig iron per day would cost $700,000.

The last named estimate is given on the authority of Dr. Héroult. Dr. Haanel considers that probably the largest unit possible on the model of the experimental plant is one of 1500 horse-power. To make the most of the experimental furnace it would be necessary to alter its construction for the application of labor saving machinery for charging and to provide for the collection and utilization of the carbon monoxide produced by the reduction of the ore. For the purpose of smelting roasted nickeliferous pyrrhotite commercially Dr. Haanel considers that no other modification of the experimental furnace is needed except enlargement.

Of the expectations raised by the experiment it does not appear from this preliminary report that any have been realized, except that a good pig iron can be produced by the process from the magnetite ores of northwestern Ontario. It is not made clear that even in this respect the process yields results greatly superior to those obtainable in the ordinary blast furnace. As to the reduction of cost that was looked for, it can scarcely be said to have been effected. At all events, $10.69 a ton is not as far below the cost of production in blast furnaces as the process seemed to promise. Perhaps too large an allowance has been made for power, which ought to be procurable at Sault Ste. Marie for $15 per horse-power, nearly twice the Hydro-Electric Power Commission's estimate of the cost of producing it at Niagara Falls. Further, if, contrary to the general understanding, the experiments have failed to demonstrate advantages of the process for steel making, there will be some disappointment. But the more complete report may show that the optimistic accounts which appeared in the press at the close of the experiments were waranted.

Explorations for Iron Ore.

If Canada has any great undiscovered fields of iron ore they should not long escape the search that is now being carried on for them by authority. In the provinces of greatest repute for their mineral areas—Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia—the crown lands are provincial property, the Dominion Government having no power of disposal over them. It is otherwise with the three provinces in the western interior. In the old provinces mentioned above the several

Governments give marked attention to mineral exploration and development. This has not prevented the Dominion Government continuing in these provinces the service of its geological survey, which has made many important discoveries of ore bodies and pointed the way to others. Still another agency is to be added. This is the mines branch of the Interior Department at Ottawa, which branch is under the direction of Dr. Haanel. He is beginning an investigation of the iron ore resources of the Dominion. Properly speaking, this is not a new departure. Some time ago a study of the zinc deposits of British Columbia was started under the same auspices, and the commission appointed for that work is expected to present its report in the early future. This year the iron ore quest will be directed along three tracts. Eastern Ontario and Quebec will be in charge of F. Cirket, western Ontario in charge of J. Shile, and Nova Scotia in charge of Professor Woodman. This investigation is undertaken in the interests of the practical operator and investor, but geological data will not be omitted where they are material to the economic objects aimed at. Magnetic surveys will be made of promising deposits and samples will be collected for analysis. Water powers are to be examined in any ore locality and estimates of their capacity are to be made. Evidently the controlling idea in this enterprise of the mines branch is to obtain information of conditions favorable to the application of the electrical treatment of ores.

Business for Rail Mills.

Thursday was the last day for receiving tenders for the 65,000 tons of rails the National Transcontinental Railway Commission desires to obtain. No announcement has yet been made as to the placing of the order. It is understood that four parties put in tenders—the Algoma Iron & Steel Company, the Dominion Iron & Steel Company, the representative of an American company and the representative of a British company. It is further stated that the outsiders' prices were higher than those of the Canadian companies and that the latter will have the order divided between them. The Dominion Iron & Steel Company is the more conveniently situated to supply the steel for the eastern half of the Government division, and the Sault company will have the advantage in the western half of that division. The latter's works lie at one end of Lake Superior, and Fort William, the lake terminus of the Grand Trunk Pacific's Lake Superior branch, is at the other. This branch is being built with expedition and will be laid with rails from the Sault mill. Over that branch can be forwarded from the same mill the rails for the 245-mile section of the National Transcontinental that is now under contract between the junction with the Lake Superior branch and Winnipeg. In Quebec another section is under contract—the 150-mile stretch between Quebec city and La Tuque—to the northwest. For this section and additions to it the Dominion Iron & Steel Company will doubtless supply the rails.

Six thousand tons of rails were recently forwarded from the Sydney mill via Cape Horn to Vancouver, to be used in J. J. Hill's Victoria, Vancouver & Eastern Railroad. Though the trip will take three months, the saving in freight will be some thousands of dollars.

The bill to incorporate the Grand Trunk Pacific Branch Lines Company is believed to have reached its final shape in Parliament. It authorizes the construction of lines aggregating 5000 miles, all subsidiary to the trunk line of the National Transcontinental Railroad. One provision added to the measure is that to preserve the right to build any branch its construction must be begun within two years and completed within five. These branch lines will therefore add another 5000 miles to the railroad track to be laid before the close of 1911.

The Dominion Steel Company's Operations.

J. H. Plummer, president of the Dominion Steel Company, gave a recent newspaper interview from which some remarks are here taken:

The earnings, though not what we hoped, show great improvement and will leave a substantial margin over fixed charges for the past year. We did not, however, get much benefit from the rail mill till well on in the year, and we have suffered this spring from a dull market in wire rods.

Under the present law it must be remembered that the bounties will be much lower after July 1, and we should suffer accordingly, but we expect that they will be extended. I do not doubt that a reasonable extension of the bounties will have the desired effect of establishing the iron and steel industries on a sound footing, and so fulfill the purpose for which Parliament granted them. The rearrangement of our finances has never yet come before the board, while as to arrears of dividend, their payment is out of our power, for we have not earned them.

I regard the outlook for business as highly satisfactory, with little probability of a check for some years to come. To keep the mills at Sydney and the Soo busy the Canadian roads would have to lay over 3000 miles of track of 80-pound rails every year. Should lighter rails be used a greater mileage, of course, would have to be laid. I do not think this mileage will be used, and it may be necessary for us to seek an export market for our surplus. We are even now negotiating with foreign buyers.

Counterfeiting of "Sheffield" Alleged.

The Cutlers Company of Sheffield, England, has taken action against the Ontario Silver Company of Niagara Falls, Ont., the charge being the latter has made fraudulent use of the word "Sheffield" on knives and of the firm names of several Sheffield cutlery concerns. The crown is not unlikely to take a hand in the proceedings.

C. A. C. J.

Milliken Brothers, Incorporated.

In connection with the offer by New York bankers of the first mortgage convertible 6 per cent. sinking fund gold bonds of Milliken Bros., Incorporated, of New York, a statement is made concerning the business and the firm's new steel plant on Staten Island. The authorized issue is $3,000,000, dated February 1, 1906, and due February 1, 1921, but subject to redemption, in whole or in part, on any interest day at 105 and interest. The sinking fund will purchase at 105 and interest $300,000 bonds annually, beginning February 1, 1912. Bonds may be converted into 7 per cent. cumulative preferred stock at par upon 30 days' notice before interest dates, from August 1, 1911, to February, 1918. President Foster Milliken, under date of March 15, 1906, writes to the bankers, referring to their purchase of the bonds, "the proceeds of which are to be used in part payment for the construction of an addition to our plant of open hearth steel furnaces and rolling mills for the manufacture of rolled structural shapes," in substance as follows:

Organization.—This business was established in 1857 by Samuel Milliken, Jr., and on January 10, 1906, was taken over by the corporation, organized under the laws of the State of New York, with the following capitalization: Stock—Preferred, $3,000,000; common, $2,500,000. First mortgage convertible 6 per cent. 15-year sinking fund gold bonds, $3,000,000. The business covers constructional work throughout the entire world, not only for the supply of structural steel work for buildings and bridges, but, in addition, general contracting, embracing all work necessary to a completed structure. Particular attention is given to export work, the company having offices in London, Antwerp, Johannesburg, Cape Town, Havana, Mexico City, San Francisco, Portland and Honolulu. So far as general contracting work in foreign countries is concerned we have furnished complete the American Tobacco Company's building in Havana, are just finishing the Barnato Building in Johannesburg, costing approxmately $1,000,000, and have had large contracts from the Mexican Government in connection with its National Post Office and the National Theater, &c.

Plant.—The present bridge and structural plant occupies about 25 acres on a plot of 165 acres of land, having a frontage of one-third of a mile directly on tidewater on the northern shore of Staten Island, New York City. The Baltimore & Ohio Railroad tracks run directly into the property. The new structural steel rolling mill plant will be the only one of its kind located on tidewater. Five 50-ton open hearth steel furnaces are being erected, with a capacity of about 136,000 tons of finished material per year. By the addition of seven open hearth steel furnaces, at an expenditure of $850,000, the output of the plant can be increased to 1000 gross tons per day. The general layout is so made that the furnaces can be increased to 21, which will give an output of 2000 gross tons per day. According to appraisals made by experts, the value of the present plant is $2,084,154; estimated cost of new steel mill, $3,294,000; quick assets of company, $864,203; total, $6,242,357. This appraisal is exclusive of the good will. The value of our real estate is here appraised at nearly $1,200,000.

Earnings.—The statement prepared by certified public accountants shows that for five years, less one month, commencing January 31, 1897, and ending December 31, 1901, the net profits averaged $163,864. The profits for the years 1902, 1903 and 1904 (in which period the plant was moved to its present site) were $1,212,407, but to this should be added an additional amount of $39,213, representing further profits on contracts then uncompleted, which makes a total of $1,251,619, or an aver-

age for these years of $417,206. The net profits for the year 1905 were $450,498, making the average for the nine years $280,160. The new steel mill will add very largely to the earning capacity, as it will give us a much wider field of operations. On the basis of the present cost of pig iron, scrap iron, coal, labor, &c., and on the present selling price of finished structural steel shapes, it is conservatively estimated that there is a profit of not less than $7.50 per net ton, and as the plant produces 136,000 net tons per year, this shows a profit of $1,020,000 per annum. We ourselves consume over 40 per cent. of the intended output, and if this mill were in operation to-day we would consume over 65 per cent. The earnings of our present business amount to over twice the interest charge.

It is expected that the new steel plant will be turning out material on October 1, 1906.

The Gilson Small Gasoline Engines.

For the users of limited power the Gilson Mfg. Company, Port Washington, Wis., is manufacturing, in addition to larger capacities, a line of gasoline engines in 1, 1½ and 2½ horse-power sizes, the general type being shown in the accompanying illustration. The smallest size is air cooled, has a 15½-inch fly wheel and 2-inch pulley and develops 1 horse-power at 500 revolutions per minute. In the construction of this engine the manufacturer has aimed to secure compactness, simplicity and accessibility of all parts, making it particularly well adapted for use in portable outfits. All danger of gasoline leakage is eliminated and a uniformity of gas mixture obtained by a well regulated suction feed arrangement.

The gasoline tank, which is of heavy galvanized iron, securely riveted and soldered, is placed below the intake pipe and its only opening is on top. Through this opening a feed pipe extends from the tank to the intake pipe and no gasoline can escape unless drawn upward through the feed pipe. This happens only when the engine is in operation. The movement of the piston creates a vacuum in the cylinder, which automatically opens the intake valve and forms a suction which draws the gasoline through the feed pipe and intake pipe into the cylinder. Air is also drawn through the intake pipe, and the quantity of air and gasoline necessary to make a good mixture is regulated by a needle valve. As soon as the engine stops the suction ceases, and whatever gasoline may be in the pipe at the time returns to the tank.

By an ingenious arrangement the intake valve is held automatically closed during the time the exhaust valve is open, thus making it possible to use any length of exhaust pipe without affecting the power of the engine. This is a desirable feature where engines are placed in houses or any place where a minimum of noise is desired. The engines are so balanced that when running without a load they can be operated without fastening skids to the floor. The ignition is by jump spark supplied by a dry battery and spark coil.

No water is required for cooling. By means of a number of flanges around the cylinder a cooling surface is provided of approximately 1000 square inches in the 1½ horse-power size and 1400 square inches in those of 2½ horse-power capacity. The cooling is augmented in the 2 horse-power size by a fan provided with a baffle plate, which throws a strong current of air directly against the cylinder head. The 1 horse-power engine is not regularly supplied with a fan, but is so constructed that a fan can be attached at any time. As the spark plug, intake valve and exhaust valve are all located in the cylinder head, they are kept cool by the air which constantly passes over them.

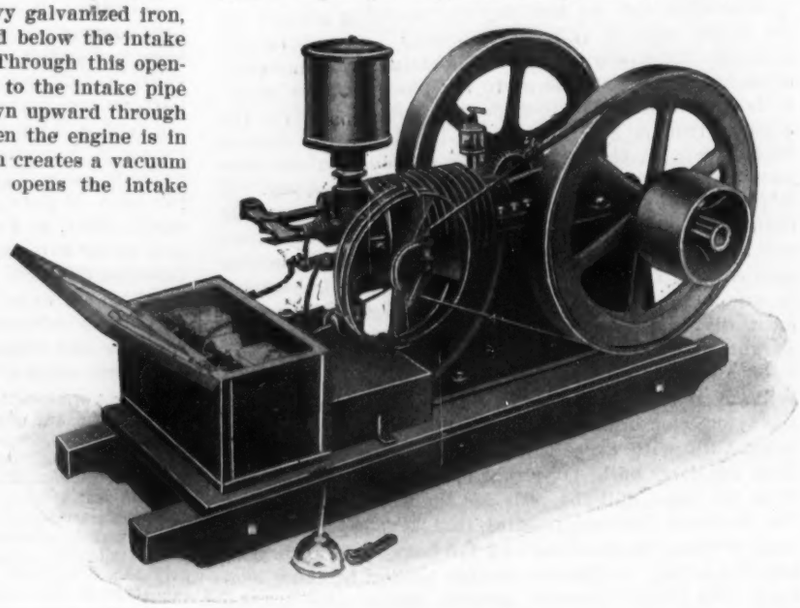
The new foundry for the Winona Technical Institute at Indianapolis is nearing completion. The building, which is of brick, is 58 x 120 feet. It will be equipped for practical foundry work. Edward A. Johnson of the University of Minnesota, a practical molder, will have charge of the foundry school at the institute. The school is for the training of molders, that the foundries of the country may more easily obtain skilled workmen. The National Founders' Association contributes $3000 a year to the support of the school.

Lackawanna Open Hearth Work.

A correspondent who is thoroughly familiar with the conditions noted has furnished the following interesting statement:

The new open hearth furnaces at the Lackawanna Steel Company's works at Buffalo, N. Y., have been doing some remarkably good work. None of the five new furnaces of this type has as yet been out for repairs, but the first to be put in commission, No. 7, has already made 300 heats without repairs and is good for from 50 to 100 heats more, the ports and roof being in absolutely perfect condition, the only weak spot being that the checkers are clogging up, so that the furnace is only making from 15 to 16 heats a week. But when it is considered that this is on producer gas and all cold metal, what furnace is doing as well on heats averaging over 60 gross tons of ingots per heat?

The last week in May No. 11 made 20 heats, producing 1260 gross tons of ingots, an average of 210 gross tons of ingots per day, with 414 pounds of coal per ton of ingots, and this on producer gas and practically a cold metal charge, the small amount of hot metal available being high in silicon, requiring as much time to work down with ore as was gained by having the metal hot, and being used in such small quantities that no time was saved over the use of a straight cold metal charge. The equipment for getting stock up to the furnace is inadequate and is being remodeled, so that unusual delays occurred during this week's performance, the furnace actually standing idle, waiting for stock, for 13 hours and 15 minutes during the week. What will such a furnace do with hot metal from a mixer where it can be delivered of uniform chemical composition and at the time the furnace is ready for it?



A Portable Gasoline Engine Built by the Gilson Mfg. Company, Port Washington, Wis.

The credit for this performance belongs to T. S. Blair, Jr., who designed the furnaces, and R. T. Harris, superintendent of the open hearth department, both of whom are well known to the open hearth world.

The original six furnaces are now being remodeled to conform as nearly as possible to the proportions of the new furnaces, and when the construction work has been finally completed some interesting developments may be looked for from this plant.

No Labor Legislation Before Congressional Recess.

WASHINGTON, D. C., June 12, 1906.—As the result of a determined stand which appears to have been recently taken by the House leaders, all indications now point to the adjournment of the present session of Congress without action on any of the radical pro-labor legislation pending in either House. The drastic 8-hour bill, favorably reported from the House Committee on Labor a fortnight ago, will probably remain undisturbed on the House calendar until after the Summer recess, while the so-called anti-injunction bills, which have been pending for several years before the House Judiciary Committee, were postponed until next December by a direct vote of 10 to 7 at a meeting of the committee held during the past week.

The Eight-Hour Bill.

The decision of the House leaders not to take up the 8-hour bill is doubtless the result of an avalanche of protests that have poured in upon the Committee on Rules from manufacturers and employers in all lines, and in almost every part of the country. Some of these protests came from prominent men in the iron and steel and metal trades, who had been promised hearings before the House Labor Committee before the vote on the bill should be taken. The Committee on Rules is much impressed with the demonstration against the measure and has practically decided not to include it in the parliamentary programme for the remainder of the session. The bill, when reported, took its place at the foot of the House calendar, and as it has been decided to adjourn Congress for the recess as soon as the Appropriation bills are all out of the way it cannot possibly come up in the ordinary course of business. To take it from its place on the calendar would require either unanimous consent or a special order from the Committee on Rules. With the very strong opposition of a large number of members of the House unanimous consent is out of the question, and the Committee on Rules, therefore, has the matter entirely under control.

The strongest argument that has been submitted to this committee emphasizes the manner in which the bill was reported, which deprives it of any equity that it might otherwise have. The Labor Committee is composed of 13 members, but when the bill was acted upon there was a bare quorum present, several of the majority members being out of the city, having relied upon the agreement to continue the hearings for at least a week. The executive session in which the vote was taken was forced by four members of the minority, who out-voted their three majority colleagues. Thus the bill is now on the House calendar by virtue of four votes out of 13 in the Labor Committee. The labor leaders are urging the consideration of the bill with great energy, but under the circumstances it is not surprising that the House leaders decline to put the measure ahead of many more meritorious propositions to which there is very little opposition.

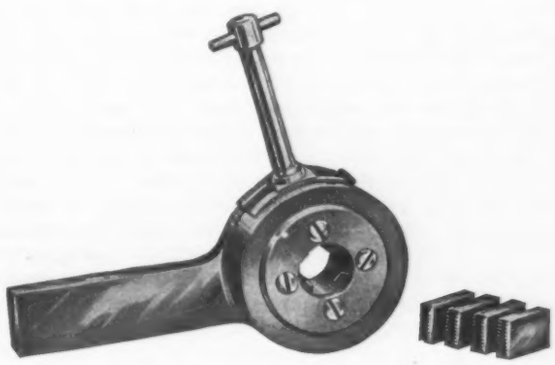
Anti-Injunction Bills.

The refusal of the House leaders to take up the 8-hour bill undoubtedly served to stiffen the backbones of several members of the House Judiciary Committee in the treatment of the anti-injunction bills. The situation with respect to these measures is peculiar. The original bill, H. R. 4445, deprived the courts of the power to issue injunctions in labor disputes and is the measure contended for by the American Federation of Labor as represented before the committee by President Samuel Gompers and others. The radical character of the bill, together with its doubtful constitutionality, has impressed some of the more conservative labor leaders, and in the last Congress the Attorney-General and the Commissioner of Corporations were induced to co-operate with the representatives of the principal organizations of railroad employees in the preparation of the bill H. R. 9328, which requires that in cases involving labor disputes neither an injunction nor a temporary restraining order shall be granted "except upon due notice to the opposite party by the court in term or by a judge thereof in vacation, after hearing, which may be *ex parte* if the adverse party does not appear at the time and place ordered."

The Administration has lent its influence to secure a favorable report on H. R. 9328, but employing interests in all sections have opposed it on the ground that the requirement as to notice would prevent the courts from granting relief in labor disputes, as in such controversies it is usually essential that the injunction should issue immediately in order to prevent the destruction of property and even loss of life. The influence of the Administration was so powerful, however, that if the labor leaders had united upon H. R. 9328 they would probably have been able to force it out of committee. But President Gompers bitterly assailed the bill, and one of his lieutenants in a statement before the committee denounced President Roosevelt as "no friend of the working man" for having interested himself to secure its passage. Under the circumstances the majority of the committee became convinced that it was impracticable to put through any measure desired by the representatives of organized labor. The original bill was regarded as entirely out of the question, and in view of the split in the labor ranks on the more moderate measure it was finally decided to put the whole question over until December. In the vote by which this was done nine Republicans and one Democrat cast their ballots for postponement, while five Democrats and two Republicans voted for the immediate consideration of the pending bills. W. L. C.

The Wilson Lathe Threading Tool.

The device illustrated, which is known as the Wilson patent lathe threading tool and is made by the Standard



The Wilson Patent Lathe Threading Tool, Made by the Standard Machinery Company, Bowling Green, Ohio.

Machinery Company, Bowling Green, Ohio, is designed for cutting true threads in the lathe centers, using the lead screw if desired and requiring but one operation. By using the lathe chuck rough bolts can be threaded in much the same manner as they would be in a bolt cutter. This tool will make a minimum thread of ⅛ inch and is particularly valuable where it is necessary to cut an absolutely perfect thread. A choice is given of sizes of dies and thread pitches within the range of the tool. With the 1-inch machine five sets of dies are furnished, and with the 1½-inch size eight sets of dies.

In the report of J. Obalski on "Mining Operations in the Province of Quebec for the Year 1905" it is stated that there has been no development in iron mining, with the exception of prospects and experiments in connection with the magnetic sands of the north shore of the St. Lawrence. According to borings beneath low tide level these sand deposits extend some distance out and could be dredged where the water is shallow. Bog ore was mined in six counties and 12,373 net tons were used in the Radnor furnace of the Canadian Iron Furnace Company and the Drummondville furnace of John McDougall & Co. Of other ores these two charcoal furnaces used 5140 net tons in 1905, part of which came from Ontario.

The American Foundrymen's Association*.

ELEVENTH ANNUAL CONVENTION.

The three days' session of the joint convention of the American Foundrymen's Association and Associated Foundry Foremen, held at Cleveland last week, came to a close June 7, the concluding meeting having been held on the steamer City of the Straits, on a trip to Lorain, where the blast furnaces and steel works of the Lorain Steel Company were inspected. The attendance, which, according to the final registration, reached a total of more than 800, is indicative of the constantly increasing interest that is being manifested in association affairs and large accessions to the membership are anticipated in consequence. The exhibition feature of foundry supplies and equipment will be made a permanent one, the exhibitors having appointed a committee to act with the association with this end in view.

Trade Schools.

The report of the Committee on Trade Schools, presented at the opening session by J. S. Seaman, Pittsburgh, aroused considerable interest. It outlined the progress that has been made during the year in the foundry department of the Carnegie technical schools, 120 students already having taken advantage of this course. In addition to their engineering studies each student goes into the foundry, where he secures the advantage of the practical side of the trade. Aside from the best manner of putting the work on the floor the students are taught the best practical ways, which consequently must be the best commercial ways. A 42-inch cupola is in operation, and an electric elevator is used for conveying material to the charging floor. The young men attend to the manipulation of the machinery, have the care of the cupola, its charging, the running off of the heats, as well as the pouring of the iron, and also attend to the core oven.

In the evening courses for the trade, where only molders are taken, the advantages that these young men have had are very beneficial. The apprentice molder, aside from securing advanced work on the floor, is taught mathematics and mechanical drawing, calculating weights of castings and setting of cores. Among other things included in the course are the lining of the cupola and charging the various mixes required for the different kinds of castings. Considerable stress is also laid on venting, as well as the consistency of core mixes and sands.

Next year the regular evening class for advanced foundrymen will be inaugurated. Lectures will be given on all branches of foundry practice, and a course in chemistry will be included. Tests will be made in the laboratory on testing machines to ascertain the physical qualities of the castings made in the school foundry, and the chemistry of sands will also be taken up. The day school of this department has not yet been started, but as soon as more buildings are completed and sufficient room provided this course will be commenced.

Standard Determination of Carbon and Sulphur.

The report of the Committee on Standard Methods for the Analysis of Iron, presented by H. E. Diller, for the determination of total carbon and sulphur, was read by the secretary. The committee was prompted to undertake this work owing to the favorable comments received from several hundred foundry and blast furnace metallurgists, to whom copies of the methods for determination of silicon in iron, reported at the last meeting, were sent, and which have since been adopted as a standard. The carbon determination follows:

The train shall consist of a preheating furnace, containing copper oxide (Option No. 1) followed by caustic potash (1.20 S. Gr.), then calcium chloride, following which shall be the combustion furnace, in which either a porcelain or platinum tube may be used (Option No. 2). The tube shall contain 4 or 5 inches of copper oxide between plugs of platinum gauze, the plug to the rear of the tube to be at about the point where the tube extends from the furnace. A roll of silver foil about 2 inches long shall be placed in the tube after the last plug of platinum gauze. The train after the combustion tube shall be anhydrous cupric sulphate, anhydrous cuprous chloride, calcium chloride, and the absorption bulb of potassium hydrate (Sp. Gr. 1.27) with prolong filled with calcium chloride (Option No. 3). A calcium chloride tube attached to the aspirator bottle shall be connected to the prolong.

In this method a single potash bulb shall be used, a second bulb as sometimes used for a counterpoise being more liable to introduce error than correct any error in weight of the bulb in use, due to change of temperature or moisture in the atmosphere.

The operation shall be as follows: To 1 gram of well mixed drillings add 100 c. cm. of potassium copper chloride solution and 75 c. cm. of hydrochloric acid (conc.). As soon as dissolved, as shown by the disappearance of all copper, filter on previously washed and ignited asbestos. Wash thoroughly the beaker in which the solution was made with 20 c. cm. of dilute hydrochloric acid (1-1); pour this on the filter and wash the carbon out of the beaker by means of a wash bottle containing dilute hydrochloric acid (1-1), and then wash with warm water until all the acid is washed out of the filter. Dry the carbon at a temperature between 95 and 100 degrees C.

Before using the apparatus a blank shall be run and if the bulb does not gain in weight more than 0.5 mg., put the dried filler into the ignition tube and heat the preheating furnace and the part of the combustion furnace containing the copper oxide. After this is heated start the aspiration of oxygen or air at the rate of three bubbles per second, to show in the potash bulb. Continue slowly heating the combination tube by turning on two burners at a time, and continue the combustion for 30 minutes if air is used; 20 minutes if oxygen is used. (The Shimer crucible is to be heated with a blast lamp for the same length of time.)

When the ignition is finished turn off the gas supply gradually, so as to allow the combustion tube to cool off slowly, and then shut off the oxygen supply and aspirate with air for ten minutes. Detach the potash bulb and prolong, close the ends with rubber caps and allow it to stand for five minutes, then weigh. The increase in weight multiplied by 0.27273 equals the percentage of carbon.

The potassium copper chloride shall be made by dissolving 1 pound of the salt in 1 liter of water and filtering through an asbestos filter.

Option No. 1.—While a preheater is greatly to be desired, as only a small percentage of laboratories at present use them it was decided not to make the use of one essential to this method—subtraction of the weight of the blank to a great extent eliminating any error which might arise from not using a preheater.

Option No. 2.—The Shimer and similar crucibles are largely used as combustion furnaces, and for this reason it was decided to make optional the use of either the tube furnace or one of the standard crucibles. In case the crucible is used it shall be followed by a copper tube 3-16 inch inside diameter and 10 inches long, with its ends cooled by water jackets. In the center of the tube shall be placed a disk of platinum gauze, and for 3 or 4 inches on the side toward the crucible shall be silver foil and for the same distance on the other side shall be copper oxide. The ends shall be plugged with glass wool, and the tube heated with a fish tail burner before the aspiration of air is started.

Option No. 3.—Barium hydrate is so extensively used as an absorbent for the carbon dioxide that your committee decided to make no recommendation as to whether its use should be made optional, but leave that point to be decided at the general meeting of the Metallurgical Section.

The sulphur determination follows:

Dissolve slowly a 3-gram sample of drillings in concentrated nitric acid in a platinum dish covered with an inverted watch glass. After the iron is completely dissolved add 2 grams of potassium nitrate, evaporate to dryness and ignite over an alcohol lamp at red heat. Add 50 c. cm. of a 1 per cent. solution of sodium carbonate, boil for a few minutes, filter, using a little paper pulp in the filter if desired, and wash with a hot 1 per cent sodium carbonate solution. Acidify the filtrate with hydrochloric acid, evaporate to dryness, take up with 50 c. cm. of water and 2 c. cm. of concentrated hydrochloric acid, filter, wash, and after diluting the filtrate to about 100 c. cm. precipitate with barium chloride, filter, wash well with hot water, ignite and weigh as

* Report continued from page 1847, issue of June 7.

barium sulphate, which contains 13.733 per cent. of sulphur.

Costs.

The question of costs was fully covered in papers presented by Kenneth Falconer, Montreal, who had for his topic "Uniform Practice in Foundry Cost Finding," and E. M. Taylor, Boston, who chose for his subject "The Correct Application of True Burden to Iron Costs."

Mr. Falconer expressed the opinion that some degree of uniformity in the cost finding methods in different foundries and different plants allied to the foundry trade would result in general good to the industry, the Steel Foundries Society of America having only recently taken up the subject of uniform methods of cost finding for steel foundries. In Canada, he said, the basis on which manufacturing expenses are distributed on cost of product is a point regarding which there is little uniformity of practice among the foundrymen, some of them distributing such expenses according to the weight of the output and others on the labor and material cost of product. Again, in some foundries the ratio of manufacturing expenses to the value of productive labor is taken as the basis, and in others the ratio of manufacturing expenses to the number of productive hours' work, irrespective of the wage price per hour, is the plan in vogue. In conclusion he said: "Uniform accounting methods are, perhaps, more important than would appear at first sight, not so much uniformity between different plants as uniform methods to be used continuously in each plant. If a foundryman or manufacturer distributes his expenses during five different years according to the same number of different plans the value of his record of costs and results for those years is largely destroyed."

Mr. Taylor's paper, which has in view the same ultimate end as that presented by Kenneth Falconer, was previously read at the meeting of the New England Foundrymen's Association on May 9. The question of foundry costs is to be carefully investigated by a committee consisting of Kenneth Falconer and Dr. Richard Moldenke. A resolution was adopted requesting the aid of all of the members of the association in arriving at some definite conclusion, the report to be presented at the next annual meeting.

Standard Methods of Making Beds.

The Committee on the Standard Methods of Making Beds reported through C. H. Thomas of South Norwalk, Conn. The table previously prepared was given to an apprentice who had been working at the trade for about a year, and his plates when cast far surpassed those made by molders of mature years and experience. As he progressed with the work he became more and more interested, and a decided improvement manifested itself in casting after casting. The metal was poured in various ways and but two plates were scarred and then only ⅛ inch deep. For plates with wide and deep prickers additional precautions were taken, cast iron rods having been driven between the rows of prickers and were thoroughly ventilated with a 3-16 inch wire. After building the runners and cleaning out the loose sand from the surface of the plate a fair coating of Portland cement, which has a tendency to form better surfaces than plumbago or lime, was shaken on with a dust bag. The cement after standing a few minutes absorbed the moisture from the sand and set and left the surface tough and rigid without being hard. This reduced the possibility of cutting in front of the runners and held the edges around the prickers in a very firm manner.

This matter is to be further taken up during the year and reports of investigations are to be submitted at the next annual meeting.

A paper on "The Beneficial Effects of Adding High Grade Ferrosilicon to Cast Iron," by A. E. Outerbridge, Jr., Philadelphia, published in *The Iron Age* for February 15, 1905, was also read.

The Scarcity of Good Molders.

This subject was discussed by W. S. McQuillin of South Norwalk, Ohio, who ventured the opinion that the foundrymen of the present day are confronted not with a scarcity of molders well developed, strong, able and willing to work, but with a scarcity of molders developed mentally and who are able and willing to think. He believed that it would be wise for foundrymen to ascertain to what extent they themselves are responsible for the scarcity of good molders; to learn whether the conditions imposed upon the men working at the trade are such that they have no chance to develop their minds, and whether the straining and crowding that will enable foundrymen to compete with each other at low prices are not factors which tend to get molders into the habit of disregarding many things so important for the production of quality. Continuing, he said that advancement in foundry practice is toward the elimination of heavy physical labor and the introduction of many labor saving appliances, and, recognizing these facts, he believed that the successful foundries of the future will be those in which the greatest amount of hard labor and disagreeable conditions have been entirely eliminated.

WEDNESDAY'S PROCEEDINGS.

The opening session on Wednesday was held in one of the smaller meeting rooms of the armory, this move having been made necessary on account of the incessant noise from the operation of the machinery exhibits in the main drill hall.

N. W. Shed, Buffalo, read an address on "Foundry Fluxes," which was discussed at length. S. M. Thrasher, Jr., of the Western Tube Company, Kewanee, Ill., said that he has used 15 pounds of fluorspar to 1 ton of iron running on 300 pounds of coke. The use of limestone alone on long heats did not work as well as desired, as the cupola to which he had reference was operated 11 hours a day. Others also expressed opinions favoring the use of fluorspar on long heats.

Dr. Richard Moldenke made a report on "Foundry Tests of Coke Made by the United States Fuel Testing Plant at St. Louis," which was received with deep interest.

Other papers presented included "A Modern Pipe Foundry," by H. A. Croxton, Massillon Iron & Steel Company, Massillon, Ohio; "Comparative Designs and Working of Air Furnaces," by Ralph West, Sharpsville, Pa.; "Multiple Molds," by James F. Webb, Elkhart, Ind.; "Electricity in the Foundry," by F. L. Antisell, Perth Amboy, N. J.; "A Talk on Alloys," by C. Vickers, Milwaukee; "Toilet Rooms and Sanitary Appliances for the Foundry," by Henry M. Lane, Cleveland.

Visit to Cleveland Industries.

The plants of the Brown Hoisting Machinery Company, Wellman-Seaver-Morgan Company and Electric Controller & Supply Company were visited by about 300 of the members on Wednesday afternoon. The new pattern storage vault system of the Brown Hoisting Machinery Company excited much interest. It is entirely detached from the other buildings and is of fireproof construction throughout. The interior is equipped with shelves for the storage of patterns, and the maintenance of an even temperature in the vault throughout the year permits of the patterns being kept in an ideal condition at all times. The 5-ton gantry crane, previously described in *The Iron Age*, also proved of considerable interest.

At the plant of the Wellman-Seaver-Morgan Company the visitors witnessed the pouring of a heat of steel from a 22-ton ladle. Charging machines in the steel foundry were also shown in operation, and the lifting magnet in the yard used for skull cracking, lifting a weight of 12,000 pounds on a current of 220 volts, was another interesting feature. This magnet is also used in filling charging boxes. An electric arc welder was shown, which is used for filling blow holes in steel castings. After visiting the plants of the Electric Controller & Supply Company the party was conveyed in special cars to the Case School of Applied Science, where the afternoon session was held. Prof. C. H. Benjamin, one of the faculty, delivered an address, illustrated with lantern slides, the following being an abstract, entitled

"Experiments on the Strength of Various Cast Iron Machine Parts."

Cast iron and soft steel are to-day the most important materials used in the manufacture of machinery: Cast

iron for frames and for those parts which are exposed principally to compression, steel for the simpler shapes which carry the tension and strain. Cast iron is a material notably weak in resisting tension and for that reason it is more or less an uncertain quantity where bending is concerned.

In so simple a thing as a cast iron beam of rectangular section theory is more or less at fault in predicting the safe load. A series of experiments which I conducted several years ago showed me that the neutral axis of such a section was not stationary, but traveled gradually up from the center of gravity as the load increased. As the sections become more complicated the stresses due to the uneven cooling begin to appear, and to still further embarrass the designer.

I long ago came to the conclusion that as far as this material is concerned we must obtain our formulas and take to experiment. Accordingly, in the past dozen years I have conducted tests in the laboratory of the school on a great variety of cast iron members to determine the actual breaking load or pressure and compare it with that deduced by theory. There were tested in this way beams of various sections, cylinders, wheels, flat plates, gear teeth, pulley arms and rims, fly wheels, rotary disks and high speed pulleys of various types.

The tests on the cast iron beams of various sections were made in 1901 and 1902. Experiments on the bursting strength of cast iron cylinders similar to those used in steam engines have been carried on from time to time. It has been found that such cylinders usually break in a circular line just back of one of the flanges instead of splitting, as theory would indicate. Furthermore, the failures occur at pressure less than one-half those given the usual formulas for their shells. This is probably due to pressure of blow holes or hot spots at the junction of shell and flange and to the bending moments caused by the pull of the cover bolts. Subsequent tests on cylinders whose flanges have been reinforced by brackets substantiate this conclusion.

The cylinders all split from end to end under a pressure approximately two-thirds that given by the formula for their shells. The other third is accounted for by the bending due to lack of uniformity in the metal. A cylinder 10 x 20 inches, with a ¾-inch wall, would burst at a pressure of about 1400 pounds per square inch, corresponding to a tensile stress of 10,000 pounds, whereas tensile tests showed the metal, a soft gray iron, to have a tensile strength of 14,000 pounds. The bursting of several of the cylinder heads under the pressure suggested the idea of testing flat plates in a similar manner.

At this point Professor Benjamin was asked to state the manner in which the cylinders upon which the experiments were made were cast. He said that he was not advised what method was used, but several of the foundrymen believed that the blow holes below the flange could be easily avoided if properly cast.

Continuing, he said: Both rectangular and square plates were tested and the results were found to be remarkably uniform. The bursting pressure varied less than 10 per cent. from that calculated by accepted formulas. The tests on gear teeth were made by applying a steady load on the testing machine, and were only conclusive as to the selection and not the absolute strength of different forms. The pressure was applied at various angles of obliquity, from 0 to 30 degrees, and two pitch involute and cylindrical teeth were selected for experiments. The shapes varied from those of pinions to those of racks, and the following conclusions were reached:

1. The plane of fracture is approximately parallel to the line of pressure, and not necessarily at right angles to the radial plane.
2. Corner breaks are likely to occur even when the pressure is uniformly distributed.
3. Rack teeth are about twice as strong as those of pinions of 15 to 20 teeth, and involute teeth are from 40 to 50 per cent. stronger than cycloidal.

The breaking pressure corresponded quite well to those calculated from the modulus of rupture of the iron used. There is reason to believe that teeth in service which have a less strength than indicated by static experiments would have substantially the same relative strength as those indicated.

In testing the arms and rims of pulleys a steel belt was used and a twisting moment thus applied to the pulley through the medium of levers and a testing machine. The pull on the tight side of the belt was graduated to twice that of the slack side, and the pulls were increased until one or more of the arms failed. The arms were slightly tapering and had twice the strength at the hub as at the rim. The fact that they broke sometimes at one end and sometimes at the other showed the ratio of the bending moments. The arm or arms nearest the tight side of the belt nearly always failed first, and we were justified in forming the following conclusions:

1. That on account of the springing of the rim the bending is unevenly distributed, so that about twice the average moment comes on the arm nearest the tight belt.
2. That the bending moment at the hub is about double that at the arm, as such pulleys are usually designed. The above ratios will be affected by variations in the relative stiffness of rims and arms.

Tests of Rotating Pieces.

The most fascinating and the most spectacular series of experiments have been those in which rotating pieces have been tested to destruction by high speed. As these tests have been carried on for nearly four years, and upward of 40 wheels of various sizes and types have been ruptured, it will be impossible at this time to give even a *résumé*.

In carrying on these experiments the wheels to be fractured were guarded by heavy oak planks 12 inches square, and as the fragments frequently split this timber the guards were reinforced with boiler plate. Wheels, models or fly wheels without flanges were operated at a speed up to 400 feet per second, while those made in sections reached the speed of only 150 feet. Placing the joint close to the spoke did not appreciably strengthen the wheel, although steel tie rods between the joints and the hubs increased the strength to some extent. English wheels, built on the bicycle wheel pattern, were the strongest wheels experimented with, giving a speed of 4000 revolutions per minute. The large number of spokes permitted of no bending of the rim. All of the wheels experimented with were 24 inches in diameter.

A slide was exhibited showing the steel guard plate over a pulley 4 feet in diameter on which the breaking strength was to be ascertained. The outer guard was made of 1¼ inch boiler plate, with ½-inch plates on the sides, and protected on the interior with oak timbers. The bursting mechanism was located inside of the shop. A balance weight weighing 3½ pounds was located inside of the rim, and the wheel burst at 1200 revolutions per minute. It should have withstood a strain of 2000 revolutions, and from this experiment the conclusions were reached that no high speed pulley should have a balance weight. An ordinary split pulley which was broken, having a balance weight inside of the rim of 3½ pounds, and whose flange weighed 7 pounds, burst at a speed of 600 revolutions per minute. Views of a broken cast steel fly wheel which reached the speed of 1700 revolutions per minute were also shown. In the bursting of this wheel some sections were hurled a distance of more than 100 feet. From these tests we reach the following conclusions:

1. Any weight on the rim between the arms of a rapidly rotating wheel, whether it be a flange, a balance weight or otherwise, is a source of weakness and danger.
2. When the weight is accompanied by a joint or any breaking of the metal at such a point the wheel is entirely unsafe at even ordinary belt speeds.
3. Solid rims of cast iron as ordinarily designed are almost entirely free from bending stresses and will not burst at speed much less than 400 feet per second.

In closing, he added that tests on cast iron disks have just been commenced, and so far the difficulties have been found greater than in any other series of experiments. The bursting speed of a disk is from one and a half to two times that of a ring, and this high speed, coupled with the severe shock of bursting, has affected the steam turbine used in making the experiments. So far three 18-inch disks have been burst at a speed of about 7500 revolutions per minute. This corresponds to a rim speed of about 600 feet per second and to a stress near the center of about 12,000 pounds per square inch.

THURSDAY'S PROCEEDINGS.

The closing session was held in the main cabin of the steamer City of the Straits on the trip to Lorain Thursday morning. Reports of exhaustive tests on core binders were presented by A. M. Loudon, Elmira, N. Y.

The election of officers followed, the report of the nominating committee having been presented by F. H. Zimmers of the Union Foundry & Machine Company, Pittsburgh, and was unanimously adopted as follows:

President, W. H. McFadden, McIntosh, Hemphill & Co., Pittsburgh, Pa.

Secretary and treasurer, Dr. Richard Moldenke, Watchung, N. J.

Vice-presidents.—New England, first district, C. J. Caley, Russell & Irwin Mfg. Company, New Britain, Conn.; New York and New Jersey, second district, John W. Burr, Brook & Houston Company, Brooklyn, N. Y.; Pennsylvania, third district, Stanley G. Flagg, Jr., Stanley G. Flagg & Co., Philadelphia; Ohio and Illinois, fourth district, J. H. Whiting, Whiting Foundry & Equipment Company, Harvey, Ill.; Michigan, fifth district, W. J. Keep, Michigan Stove Company, Detroit, Mich.; Minnesota and Wisconsin, sixth district, Thomas Sheriffs, Sheriffs Mfg. Company, Milwaukee, Wis.; Southern States, seventh district, J. B. Golden, Golden's Foundry & Machine Company, Columbia, Ga.; Canada, eighth district, L. L.

Anthes, Toronto Foundry Company, Ltd., Toronto, Canada.

Votes of thanks were extended the presiding officers and the members of the Cleveland entertainment committee, who had done so much to make the convention a success. A rising vote of thanks was also extended Secretary and Treasurer Dr. Richard Moldenke for his untiring efforts in the organization's behalf.

Before adjournment a committee consisting of C. N. Caley, of the Russell & Irwin Mfg. Company, New Britain, Conn., and Dr. Richard Moldenke was appointed for the purpose of aiding in the formation of an organization to be known as the American Brass Founders' Association. J. F. Webb, Elkhardt, Ind., was promised the association's support and instructed to proceed with experiments to ascertain the effects of the use of nickel in cast iron. A. W. Belden of the United States Geological Survey briefly outlined the methods that are being pursued at the coal testing plant in St. Louis to ascertain the coking properties of coal. Kenneth Falconer and Dr. Moldenke were appointed a committee empowered to name two or three additional members to devise some uniform method of estimating foundry costs. All of the members of the association are requested to aid this committee in its work, and it is believed that some definite basis of estimating costs can be arrived at and the conclusions are to be reported at the next meeting.

The Philadelphia Foundrymen's Association having requested the next convention to be held in that city, the Executive Committee was instructed to make such arrangements for the meeting next year. An invitation was also received from Toronto to meet there in 1907.

The Cleveland entertainment features included a theatre party at Keith's on Tuesday evening, excursion to Luna Park on Wednesday, and a smoker at the Central Armory Thursday evening. The ladies were given an automobile ride about the city Wednesday afternoon.

The Exhibitors.

The complete list of exhibitors follows:

American Sand Company, Columbus; molding sands; represented by F. A. Downard and A. R. Tingle.

Arcade Mfg. Company, Freeport, Ill.; molding machines; represented by F. N. Perkins.

Atlas Car & Mfg. Company, Cleveland; industrial tracks and railroad equipment; represented by T. A. Williams, Jr.

Berkshire Mfg. Company, Cleveland; molding machines in full operation; represented by R. H. York and A. N. Battenfeld; souvenir, paper weight.

Adam Brandau, Detroit; fireproof molders' shoes; represented by Adam Brandau.

Bruce-Meriam-Abbott Company, Cleveland; 55 horse-power gas engine in operation; represented by A. E. West.

Buckeye Milling Company, Cleveland; dry core compound; represented by R. A. Tidball.

Buckeye Sand Company, Pittsburgh; molding sands; represented by Ira E. Bixler and Walter Rutson.

Chicago Pneumatic Tool Company; chipping hammers, sand rammers, air compressors and hoists; represented by C. T. Smith.

Chisholm & Moore Mfg. Company, Cleveland; chain hoists and I-beam trolleys.

Cleveland Chaplet & Mfg. Company, Cleveland; wrought iron chaplet and chaplet stems; represented by W. A. Cronenberger.

Cleveland Wire Spring Company, Cleveland; steel shop boxes.

Connersville Blower Company, Connersville, Ind.; blowers; represented by R. T. Huston.

Crystal Fluorspar Mining Company, Cleveland; lump gravel and ground fluorspar, lead and zinc.

E. A. Dempwolf & Sons, York, Pa.; hydrofluoric acid.

Detroit Foundry Supply Company, Detroit; galvanized rim riddle and foundry supplies; represented by E. J. Woodison, L. A. Crandall, W. K. Beers and W. Bruce Howard.

Diamond Clamp & Flask Company, Richmond, Ind.; snap flasks and clamps; represented by W. N. Gartside.

Wm. Dobson, Canastota, N. Y.; molders' tools; represented by Wm. Dobson; souvenir, aluminum rule.

Electric Controller & Supply Company, Cleveland; lifting magnet in full operation; represented by W. A. Ten Winkle.

Falls Rivet & Machine Company, Cuyahoga Falls; core room equipment; represented by George H. Wadsworth.

Goldschmidt Thermit Company; exhibition of welding by the thermit process; represented by Ernest Stutz and A. M. Guenther.

Harbison-Walker Refractories Company, Pittsburgh; fire brick and cupola blocks.

Herman Pneumatic Machine Company, Zelienople, Pa.; jarring molding machine; represented by H. C. Herman.

Holland Linseed Oil Company, Chicago; core compound; represented by C. B. Baumgartner.

Interstate Sand Company, Cleveland; molding sands; represented by H. C. Koontz, F. E. Gordon, L. K. Brown and E. M. Ayres.

W. W. Lindsay & Co., Philadelphia; chaplets and anchors; represented by J. I. Fasy; souvenir, paper weight.

Monarch Engineering & Mfg. Company, Baltimore, Md.; Harvey metal melting and refining steel furnace, rivet heating furnace, blowers and air compressors; represented by James V. Martin.

Municipal Engineering & Contract Company, Chicago; represented by W. J. Rosebery, Jr.

J. S. McCormick Company, Pittsburgh; foundry supplies; represented by T. E. Malone; distributed handsome booklet containing reproduction of association and convention groups for every year since the first meeting was held in Philadelphia in May, 1896.

Newport Sand Bank Company, Newport, Ky.; represented by J. Frank Dye; souvenir, bags of sand and imitation sand bags in the form of sachet pouches.

S. Obermayer Company, Cincinnati; foundry supplies; represented by E. D. Frohman and S. T. Johnston; souvenir, postal card.

Osborn Mfg. Company, Cleveland; foundry brushes, mallets and other supplies; represented by E. F. Streich; souvenir, clothes brush.

E. H. Mumford Company, Philadelphia; molding machines; represented by E. H. Mumford and J. H. Rathbone.

Thomas W. Pangborn Company, New York; foundry equipment and supplies; represented by J. B. Bothan.

Republic Belting & Supply Company, Cleveland; belting and supplies; represented by S. C. Cutler.

W. W. Sly Mfg. Company, Cleveland; cinder, tumbling and resin mills and dust arresters; represented by W. W. Sly; souvenir, pocket book.

J. D. Smith Foundry & Supply Company, Cleveland; Blundell pneumatic sand shaker and foundry supplies; represented by J. S. Smith, P. S. Smith, Milton Finley and Fred A. Coleman.

Standard Sand & Machine Company, Cleveland; mixers, dryers, screens and elevating machinery for foundry; represented by H. G. Boughton and W. H. Smith.

B. F. Sturtevant Company, Boston; high pressure blowers; represented by W. H. Coleman.

Tabor Mfg. Company, Philadelphia; molding machines; represented by J. W. Dopp.

Western Foundry Supply Company, East St. Louis, Ill.; ground ferromanganese and foundry supplies; represented by J. A. Rogers; souvenir, one pound bags of ground ferromanganese.

White Tool & Supply Company, Cleveland; pattern making, tools and equipment; represented by F. C. White.

Whiting Foundry & Equipment Company, Harvey, Ill.; Whiting cupola; represented by S. T. Johnston.

A committee was appointed by the exhibitors to cooperate with the American Foundrymen's Association at future conventions with a view to making the display of foundry supplies and equipment a permanent feature, as follows: C. T. Smith, S. T. Johnston, V. E. Kenavel, F. C. White and F. W. Hubbard. The outcome was the formation of the American Foundrymen's Supply Association, with the following officers: President, S. T. Johnston, Chicago; vice-president, E. H. Mumford, Philadelphia; second vice-president, E. A. Keopler, Pittsburgh; secretary and treasurer, H. M. Lane, Cleveland.

The General Electric Company's San Francisco Offices.—The General Electric Company, which established its main office in the Union Savings Bank Building, at Oakland, Cal., immediately after the San Francisco disaster, as well as a local office at 1759 Geary street in the burned city, has already leased a suite of rooms in the new Monadnock Building, which it expects to occupy about June 15, 1907. For handling the present business half a block of land has been leased in Emeryville, in close proximity to both the Santa Fé and Southern Pacific railroad tracks. A temporary building is now about completed on this land for taking care of stock, and work has been started on a warehouse, containing about 80,000 square feet, which will be located at the south end of the block, bounded by Kansas, Rhode Island, Fifteenth and Alameda streets. At the temporary warehouse 40 cars of materials have been housed and 19 cars of additional apparatus are now in the yards waiting to be unloaded, with 30 or 40 more cars *en route* from Schenectady. Additional cars are being sent from the company's factories, so that the stock at San Francisco will soon be complete. At present the company is in excellent condition to fill orders as rapidly as before the fire.

The Lake Superior Mining Institute, A. J. Yungbluth, secretary, Ishpeming, Mich., will hold its twelfth annual meeting in the Michigan copper country on August 8 to 10. Local committees are now arranging a programme for the entertainment of the members and guests.

The New Greenaway Oil Separator.

The accompanying engravings illustrate the new special oil separator manufactured by the Greenaway Company, Detroit, Mich.

Referring to Fig. 1, the exhaust steam enters at the left hand flanged opening, a full view of which is shown in Fig. 2. The steam in its passage through the separator is impinged upon an area of vertical V-shaped wet plates secured in a position at right angles to the steam current. The plates are arranged in two rows, and, as shown in Fig. 2, the first row of plates in the path of the steam is placed with the convex sides or "noses" toward the entrance. The second row of plates is staggered with respect to the first row and is so placed that the open angle or concave side is situated opposite the spaces between the plates of the first row and facing the direction of flow.

The steam in its passage through the separator is

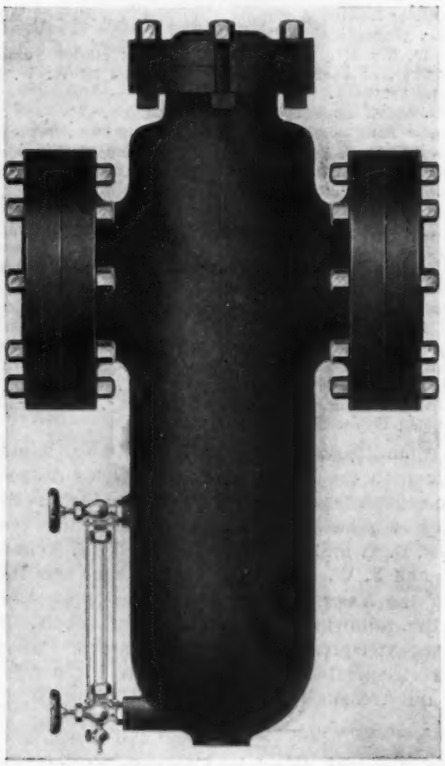


Fig. 1.—Exterior View of the New Greenaway Oil Separator.

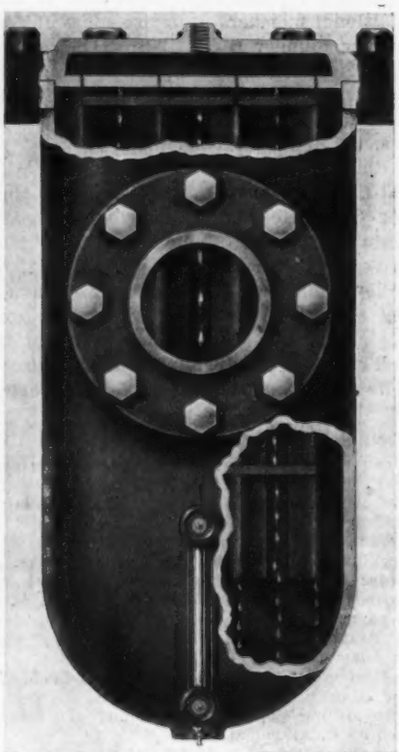


Fig. 2.—A Broken Out View Showing the Baffle Plates, Water Chamber, &c.

deflected by the first row of plates and trapped in the crotches of the second row. At this point the direction of flow is reversed and the steam is directed into the crotches of the first row, whence it is again reversed and passes into the outlet chamber. The oil held in suspension by the steam is completely removed by being whipped into the crotches of the wet plates, whence it drops by gravity into the settling chamber and drain pipe below. The plates are supplied with the necessary moisture from a water chamber in the head. Drip holes are provided at the top end of each crotch, through which the requisite amount of water trickles.

A notable feature of this new oil separator is the ease of accessibility. The combined head and wet plates may be removed without interfering with the steam pipe fittings.

The separator is also provided with a gauge for noting the hight of separated oil in the receiving chamber.

The Indiana Supreme Court has decided that the law of 1887, requiring mining and manufacturing companies to pay their employees at least twice a month, is valid, and that the penalty for delay in paying wages after demand, in no event to exceed twice the amount of wages due, is neither excessive nor oppressive. The decision also declares that the payment of wages semimonthly is mandatory only when an employee makes a demand for his money twice a month, but that the statute in no manner requires the employee to exercise this right against his own volition.

An Important Customs Administrative Bill Reported.

WASHINGTON, D. C., June 12, 1906.—The Ways and Means Committee has decided that it is desirable and practicable to pass through the House at the present session a tolerably comprehensive bill amending several of the most important provisions of the customs administrative act of June 10, 1890, and has therefore favorably reported a measure for that purpose. The committee has long had this project in view, but until recently there has been so much contention among opposing interests that it has not seemed advisable to attempt any legislation at this session. The bill will be taken up at an early date and every effort will be made to put it through the House before the summer recess. The new bill, which has been drafted by Chairman Payne, provides for the amendment of sections 5, 7, 12, 13, 14 and 15 of the customs administrative act and embraces the most important suggestions that have been made by the Merchants' Association, the New York Board of Trade and Transportation and leading customs lawyers of the metropolis. It is not claimed that the measure as reported is a perfect bill, and it is to be expected that when it reaches the Senate Finance Committee it will there be carefully revised and probably not reported until next December. W. L. C.

One of the largest artificial storage reservoir hydroelectric power plants in the world is under construction on the River Sihl, in the Canton of Schwytz, Switzerland. A dam 90 feet high and 350 feet long will impound the water in a lake with a surface area of two square miles. The capacity of the reservoir will be 25,360,000,000 gallons. The generating plant will be upon the shore of Lake Zurich, and will be operated under a head of 1575 feet. It is estimated that a continuous supply for 20,000 horse-power will be afforded, or for 45,000 horsepower if operated only ten hours per day.

The American Society for Testing Materials.

The ninth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., June 21, 22 and 23, 1906, with headquarters at the Hotel Chalfonte. The first session will begin at 3 p.m. on Thursday, June 21. The annual report of the Executive Committee will be presented and memoirs of deceased American investigators who have contributed in a marked degree to the advance of the testing of materials will be presented by Gaetano Lanza. Reports and papers relating to road materials will be read; also reports on standard specifications and tests for sewer pipes, on fireproofing material and on standard specifications for the grading of structural timber. Miscellaneous business and the election of officers will come at the end of the session.

On Thursday evening the annual address will be delivered by the vice-president, Robert W. Lesley of Philadelphia, in the absence of the president, Dr. Chas. B. Dudley, who is in Europe. At the same session S. W. Stratton will speak on "The National Bureau of Standards," and Richard L. Humphrey will read a paper on "Some Effects of Earthquake Shock and Fire on Materials and Buildings at San Francisco."

Separate meetings will be held at the Friday morning session by the sections on Iron and Steel and on Cement and Concrete. For the Iron and Steel section the programme is as follows:

The Corrosion of Steel as Affected by its Chemical Composition. J. P. Snow.

Electrolytic Corrosion of Steel. Maxmilian Toch.

Topical discussion on the Corrosion of Iron and Steel; opened by H. M. Howe, Allerton S. Cushman and James Christie.

Report of Committee F on Heat Treatment of Iron and Steel. H. M. Howe, chairman.

The Effect of Heat Treatment on High Carbon Steels. William Campbell.

The Beneficial Effect of Adding High Grade Ferrosilicon to Cast Iron. A. E. Outerbridge.

At the fourth session, on Friday afternoon, separate meetings will be held by the sections on Specifications for Iron and Steel and on Preservative Coatings, the programmes being as follows:

On Specifications for Iron and Steel.

Report of Committee A on Standard Specifications for Iron and Steel. W. R. Webster, chairman.

Discussion on Standard Specifications for Ship Material; opened by E. P. Stratton and W. R. Webster.

Experiments on the Segregation of Steel Ingots in Its Relation to Plate Specifications. C. L. Huston.

Fire Box Steel—Failures and Specifications. Max H. Wickhorst.

On Preservative Coatings.

Report of Committee E on Preservative Coatings for Iron and Steel. S. S. Voorhees, chairman.

Protective Coatings for the Preservation of Steel. Arthur B. Harrison.

Practical Testing and Valuation of Japan. Robert Job.

Testing of Shellac Varnish. A. C. Langmuir.

The evening of Friday, June 22, will be held open. Separate meetings will be held at the fifth session, on Saturday at 10 a.m., by the sections on Metals and Fuels and on Cement, Concrete and Asphalt. The programme of the Metals and Fuels section is as follows:

Report of Committee B on Standard Specifications for Cast Iron and Finished Castings. Walter Wood, chairman.

Report of Committee J on Standard Specifications for Foundry Coke. Richard Moldenke, chairman.

Some Results of the Government Fuel Tests at St. Louis. J. A. Holmes.

Report of Committee M on Standard Specifications for Staybolts. H. V. Wille, chairman.

Report of Committee O on Uniform Speed in Commercial Testing. Paul Kreuzpointner, chairman.

Report of Committee T on the Tempering and Testing of Steel Springs. J. A. Kinkead, chairman.

Report of Committee R on Uniform Specifications for Boilers. E. D. Meier, chairman.

Tension Tests of Steel Angles. F. P. McKibben.

The afternoon session of Saturday will be in two sections, as follows:

On Waterproofing and Testing Machines.

Report of Committee S on Waterproofing Materials. A. W. Dow, chairman.

Some Mistakes in Waterproofing. E. W. De Knight.

Methods of Testing Cements for Waterproofing Properties. W. P. Taylor. Discussion to be opened by E. W. Lazell.

Report of Committee K on Standard Methods of Testing. Gaetano Lanza, chairman.

New Features of Two Large Testing Machines. W. C. Du Comb, Jr.

The Purdue University Impact Machine. W. K. Hatt and W. P. Turner.

On Miscellaneous Subjects.

Report of Committee G on the Magnetic Testing of Iron and Steel. Walter J. Esterline, chairman.

A Complete Equipment for Magnetic Testing. Walter J. Esterline.

Mechanical Experiences with Limber and Stiff Rail Sections. P. H. Dudley.

The Effect of Combined Stresses on the Elastic Properties of Iron and Steel. E. S. Hancock.

Tests of Metals in Reverse Torsion. E. S. Hancock.

Additional Data on the Rattler Test for Paving Brick as Disclosing the Limit of Permissible Absorption. Edward Orton, Jr.

The meeting will be brought to a close by a brief joint session for the transaction of miscellaneous business.

The International Association for Testing Materials.

Announcement has been made of the programme of the fourth congress of the International Association for Testing Materials, which will be held at Brussels, Belgium, September 3-8, 1906. At the general meeting on Monday, September 3, a commemorative speech in honor of the late president, Professor Tetmajer, will be made by Prof. F. Schüle, and there will be a lecture on the industries of Belgium. Section meetings will be held on Tuesday and Wednesday forenoon, with visits in the afternoon to places of technical interest in Brussels and vicinity. There will be a general meeting on Thursday, with reports of sections, and on Friday a visit to the works of the John Cockerill Company, Seraing. The delegates will visit the Harbor Works in Zeebruge on Saturday. It is stated in the report of the council that the membership on January 1, 1906, was 1814, as against 2200 in the preceding year. The decrease is attributed to the withdrawal of American members, the number from this country having fallen from 600 to 241 in consequence of the action taken at the 1905 meeting of the American Society for Testing Materials in raising its membership fee to $5 and leaving its members free to take membership in the International Society as individuals. Previously a portion of the $5 fee of each member of the American Society had been sent to the International Society.

Fast Coal Unloading.—On May 29 and 30 some remarkably fast coal unloading was done by the No. 2 machine at the Rondeau dock of the Lake Erie Coal Company, Limited. This machine in 7 hours and 24 minutes actual working time discharged from the Marquette & Bessemer No. 1 boat a cargo of 1653 tons of lump coal, making an average of 223½ tons per hour, including cleaning up, about half of the cargo having been unloaded into cars and the balance on stock piles. The machine referred to was installed by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and is fitted with a Hulett patent excavating bucket of 5 tons capacity.

George W. Pennington Sons, Incorporated, San Francisco, state that their office and branch works at 313 Folsom street were totally destroyed by the great fire, but their main works at the southwest corner of Montgomery and Chestnut streets were not injured in any way and are in first-class condition. They have resumed operations there and are prepared to fill orders as usual for all kinds of iron and steel forgings. Pending the erection of a new building at 313 Folsom street they have opened a temporary office at 934 Shotwell street, San Francisco. Within a few days they will return to their former address, 313 Folsom street, to which mail can now be addressed.

The Electrical Trades Exposition Company, Chicago, has issued a booklet entitled "Retrospective and Prospective." It outlines the success which attended the first electrical show held in Chicago last January, and indicates the plans for the 1907 show to be held at the Coliseum, Chicago, January 14-26.

A Proposed New Customs Bonding Regulation.

The Treasury Department, in connection with officials of the New York Custom House, is at work on a new plan affecting the bonding of dutiable goods transported over railroads from ports of entry to their ultimate destination. The details have not been completely worked out and there is said to be more or less opposition on the part of some interests to accept the new plan, but if an agreement can be had an official circular will be issued by the Treasury Department promulgating the revised rules.

The Government officers responsible for the proposed change in the regulations believe that the revised rules will result in facilitating the delivery of bonded goods to the consignee, as well as protecting the interests of the buyer and the Government. It is proposed to scrutinize entries more closely at the port of entry in the case of goods destined for transshipment in bond over railroads, either to a foreign country or to an interior point in this country. Another innovation is the proposal to have a manifest printed to a special form and on paper of a distinctive color in order to facilitate the identification of bonded merchandise *en route* and at the place of delivery. Under the present system goods shipped across the country in bond to ports of "immediate delivery" are sometimes delivered to the consignee directly without passing through the hands of the customs officers, such delivery being due to the failure of the railroad employees to identify the packages as containing bonded goods. For the same reason that special manifests or waybills are printed, distinctive marks will be placed on the packages themselves.

In this way it will be possible to have a careful system of checking up all along the line from the time the goods leave the port of entry until they reach the interior port and the consignee. Another modification contemplated reduces the penalty for improper delivery of goods —that is, for delivery to the consignee without first passing through the hands of the customs officers at the interior port. As constituted at present double duties must be paid as a penalty, but it is hoped to compensate the Government for the reduction in penalty by keeping a closer check on the transit of merchandise. At present many believe that a premium is placed on deception.

The American Shipbuilding Company, Cleveland, Ohio, has taken an order from Henry Steinbrenner for a 10,000-ton steamer for 1907 delivery. The boat will be 545 feet over all, 525 feet keel, 55 feet beam and 31 feet deep, equipped with triple expansion engines and two Scotch boilers.

The Piqua Positive Blower.

In its new plant at Piqua, Ohio, the Piqua Foundry & Machine Company has developed a new line of rotary positive blowers, gas exhausters and rotary pumps, embodying many improvements in design and construction. The blowers are especially adapted to foundry, forge fire and oil furnace service or for all purposes requiring a positive supply of air under pressure of 12 pounds per square inch and less. While the blower follows the general principle of a type of machine that has been on the market for many years, it is radically different in details of design and construction. Perhaps the most important and conspicuous difference is in the general proportions. The blower is comparatively much shorter and larger in diameter than usual, insuring greater rigidity, short leakage line and smaller clearance spaces generally, which are vital points in any positive blower and determine its efficiency. Compared to other machines of equal capacity this new design requires less floor space and allows higher speeds to be maintained, making it possible to secure much greater output. The blower is shown in the illustration herewith, Fig. 1 being an exterior view and Fig. 2 a cross section.

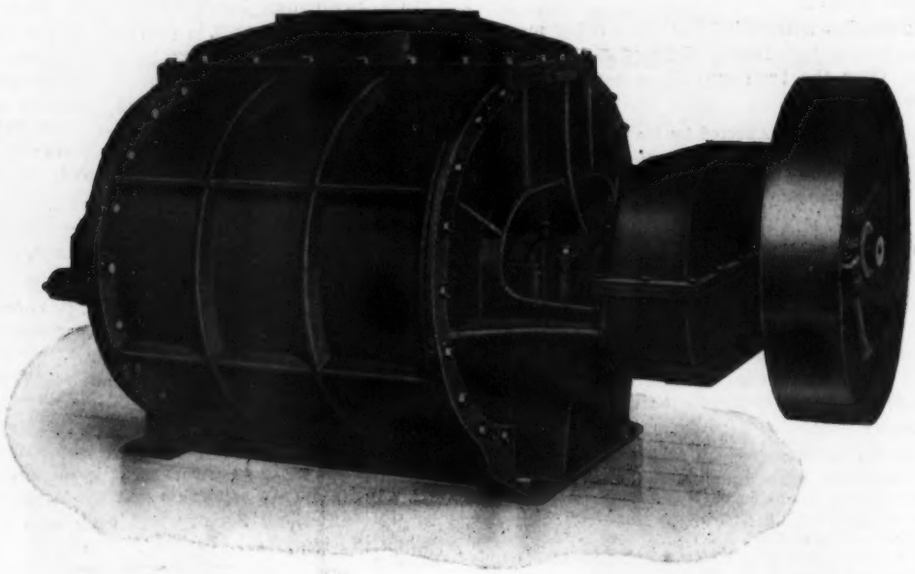


Fig. 1.—Positive Blower Built by the Piqua Foundry & Machine Company, Piqua, Ohio.

The head plates of the blower are heavily ribbed castings designed to rigidly support the entire weight and strains of the machine. The supporting ledges for the journal boxes are planed, and all small and medium sized machines are fitted with the company's improved self oiling journal box, the cap of which has a tongue to engage a groove in the lower half to insure perfect alignment and is lined with a special high grade Babbitt metal hammered into place and bored. Each journal has two loose oil rings dipping into deep oil reservoirs, insuring a uniform and liberal supply of oil to the journals while the blower is in operation. Means are provided for adjusting the box and impellers when after long usage it becomes necessary. In the larger machines, intended for continuous duty, ring oiling quarter boxes are provided when desired. Practically no attention is required. Large journals, best of Babbitt metal and abundant provision of oil are three features of the blower which contribute to long life, elimination of friction and attention. All gears are cut from solid stock and revolve in oil baths in oil tight gear cases. The cylinders are heavily ribbed castings, designed to withstand all stresses incident to these machines, and are bored on a special boring machine designed and built for the purpose.

In the case, which is formed of the parts described above, which are strongly bolted and taper pinned together, revolve two impellers, which are symmetrical cored castings forced by hydraulic pressure upon large steel

shafts extending their full length. These, as shown in Fig. 2, being exact duplicates, do equal duty. They are finished all over with two cuts and are perfectly balanced. The impellers revolve closely together, with only very slight clearance, but never come into actual contact with each other or the case, which gives the basis for the company's claim that the blower has no internal friction and runs quietly and smoothly. Due to the long arc of the so-called contact surfaces, formed by the concave and convex surfaces of the two impellers in the case, the slippage is very slight. This long arc is preserved practically during the entire revolution. The slippage is further reduced by the small amount of clearance due to the improved short, rigid design.

From the table given in the company's bulletin No. 10 describing the blower, which gives the speeds, discharge and melting capacities, it is of interest to note that the blowers are capable of a very high melting capacity. The company states that the speeds listed are very conservative in view of the short, rigid design and large journals. The company is prepared to build all

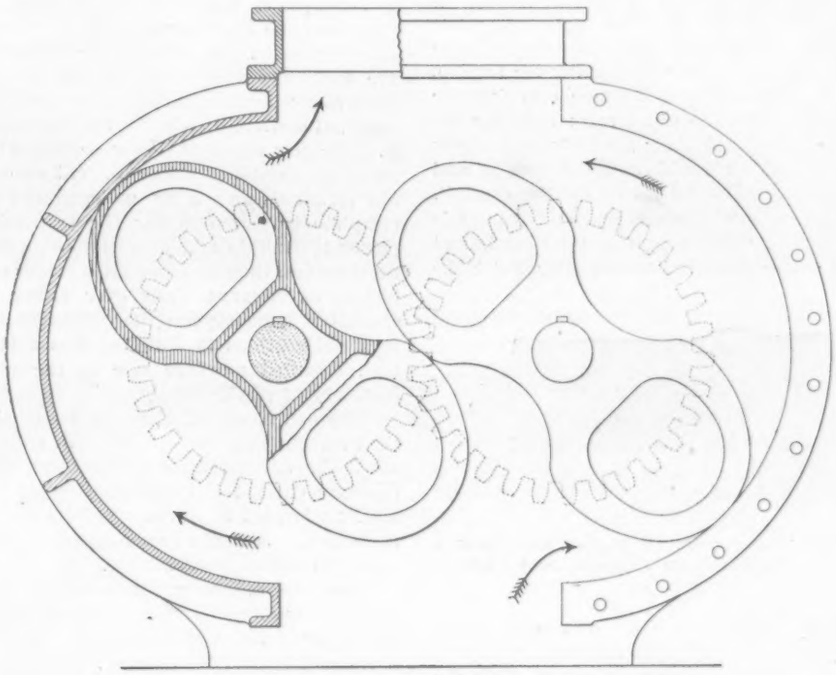


Fig. 2.—Cross Section through the Piqua Positive Blower.

sizes of blowers from 1 cubic foot per revolution capacity up, both vertical and horizontal type, adapted for smelters, foundry cupolas, oil furnaces, forge fires, pneumatic cash tube service, &c.

These blowers are furnished with pulleys for belt drive or are mounted on bed plates with an engine or electric motor attached.

The Western Malleable Steel Company.—This company, located at Detroit, Mich., is erecting a drop forging plant to cost $110,000. The forge shop will be 70 x 125 feet and will be equipped with 24 hammers and presses ranging from 3500 down to 800 pounds, purchased from the Toledo Machine & Tool Company, Toledo, Ohio. The presses will be operated by two line shafts each driven by 50 horse-power motors. The heating system will be fuel oil, using compressed air. The Chicago Pneumatic Tool Company furnished the compressor, which gives about 700 feet of air a minute. The tool and die room will be 30 x 100 feet, equipped with Gray planers, Gould & Eberhardt shapers, Schumacher & Boye lathes and Cincinnati drills. The tools for this department have all been ordered. They will be driven by one 30 horse-power motor. Altogether about 200 horse-power will be used in the plant, the current being furnished by the Edison Illuminating Company, Detroit. The company is also erecting an additional foundry building, 75 x 125 feet, and a new coreroom building, 40 x 100 feet. This building will give a foundry building 75 x 250 feet. The equipment has already been provided for. C. L. Bockus, who has been superintendent of the Consolidated Mfg. Company, Toledo, has been made manager of the drop forging department of the Western Malleable Steel Company.

Customs Decisions.

The Board of United States General Appraisers has decided that the George W. Pierce Company, Buffalo, cannot be granted relief in assessments made by the collector on importations of merchandise invoiced as iron forgings and stamped steel shapes. The collector classified the merchandise under the provision in the tariff law for steel forgings with duty at the rate of 35 per cent. The importers failed to submit evidence in support of their contention.

In a decision by I. F. Fischer, the Board of General Appraisers has overruled claims filed by F. Paracchini & Co., San Juan, Porto Rico. The merchandise is described in the invoice as brass wire gauze and as charcoal box iron and bent pipes. Duty was assessed on the former at the rate of 45 per cent. and 1¼ cents per pound under the provisions of paragraphs 193 and 137, respectively, of the tariff act, and on the latter at 45 per cent. under paragraph 193. The irons are claimed to be dutiable property at 6-10 cent per pound under paragraph 148, and the brass wire gauze at 40 per cent. and 1¼ cents per pound under paragraph 137.

Judge Somerville has written a decision for the Board of Appraisers denying a protest filed by Hugo Sahn & Co., New York, in which it was contended that reappraisements made by a single general appraiser and a board of three appraisers were illegal. The invoice values raised by the board of reappraisement concerned metal caps.

Under conditions where a weir could not be built, a novel way of measuring the flow of an artesian well was devised. Forty feet of 10-inch pipe was screwed into a 90-degree elbow on the pipe where it came out of the ground, and a hand force pump attached to a small hole tapped into this pipe. The force pump drew a red aniline liquid from a pail and injected it into the stream, where it was carried along with the water and at the same rate. By means of a stop watch and the known carrying capacity of the pipe the flow of the well was easily determined.

The Johns-Manville Sectional Steam Pipe Conduit.

In the transmission of steam and hot water underground it has always been a problem to avoid a considerable loss of heat by radiation into the ground. To overcome this waste the H. W. Johns-Manville Company is now placing on the market sectional tile pipe conduit, the object of which is to thoroughly insulate and protect the pipes, and for a reasonable cost. This is known as the "J-M" Portland sectional conduit and consists of tile pipe made in top and bottom sections, the parting being baked and afterward broken, so that the joint resembles that of the replaced pieces of a broken plate. By the use of neat hydraulic cement it is possible to put these sections together, making practically a perfect looking piece again. As the top and bottom sections are numbered to correspond the same sections can always be mated, and thus a perfect joint is secured.

The inclosed pipes are supported in tee sections, which are placed in the lines of conduit from 12 to 18 feet apart, depending upon the size of the pipes inclosed. This supporting tee section is placed firmly on a bed of concrete which is carried up into the supporting tee section, the concrete holding the metal roll frame carrying the rods and rolls upon which the pipes rest; thus the entire weight of the pipes and their contents is entirely independent of the conduit itself, and the weight and movement of the pipes cause no injury to the conduit.

The conduit with supporting tees and roll frames is laid section by section until a line is completed, and then the pipes are put in place and tested, after which the

The J.-M. Portland Sectional Conduit for Steam Pipe, Manufactured by the H. W. Johns-Manville Company, New York.

insulation may be applied. This insulation may be sectional pipe covering, or, better, asbestos sponge conduit filling, and fills the entire space in the conduit about the pipe, being inserted while the top sections of the conduit are applied length by length. It is customary to place under this conduit an underdrain to remove the water, which would otherwise lie against the conduit and absorb heat. Should occasion arise to open the conduit after the installation is complete it can be readily done.

Special merit is claimed for certain features of this conduit. The system is simple, due to its few parts, each part being designed for its particular function. The pipes may be installed easily and the insulation may be applied more easily, while the pipes are accessible for repairing. The conduit is water, fire and acid proof, is itself practically indestructible, and no opening of the joints is caused by any movement or weight of the pipes on account of the form of support provided. With proper care in laying the conduit it is practically watertight; the cost of maintenance is nothing, and so far as the conduit is concerned it would seem that constant service is assured.

Careful tests have been made to determine the loss of heat in transmitting steam underground in this form of conduit. The most recent, which was made by Geo. H. Barrus, consulting engineer, Boston, has shown that the loss of heat was less than that usually found in pipes installed in buildings with the best commercial grades of sectional pipe covering to be had in open market, which would seem the most satisfactory in view of the fact that the pipes installed underground are placed in a more difficult position because of the amount of water in the ground and the lower temperature of the ground. One reason for the greater efficiency is that the pipes are protected against any movement of air over them, which would tend to cause a considerable loss of heat.

Buffalo Terminal System for Niagara Power Supply.

The Cataract Power & Conduit Company, Buffalo, N. Y., has commenced the erection of a new transformer station, or terminal house, of large size and 25,000 horsepower capacity, on the high bank of the river at Niagara street and Front avenue. This terminal house is being constructed to receive the power generated at the power house of the Canadian Niagara Power Company, Niagara Falls, by two power transmission lines running along the Canadian side of the Niagara River from the power house at the falls to Fort Erie, opposite Buffalo, whence entrance to the city will be made by an overhead span crossing the Niagara River at a hight of 150 feet above the river, suspended from shore towers 210 feet in hight.

Transmission line connection already exists between the two power houses of the Niagara Falls Power Company and the American side and the power house on the Canadian side, and these three power generating plants are now connected with Buffalo by four transmission lines along the American side of the river to the present terminal station, which will be known as Terminal House A. The new terminal power station, which will be designated as Terminal House B, will be connected with the old terminal station by underground cables, making a complete loop system for the transmission of Niagara power to Buffalo and its distribution there. Power connections can then be made from either of the three power houses at Niagara Falls over either the American or Canadian transmission lines through either of the two terminal stations in Buffalo, thus making an ideal system, equalled nowhere else in the world for absolute certainty of power supply.

The equipment of the new terminal station will for the present consist of six 3000-kw. transformers, stepping down the current from 22,000 volts to 11,000, at which pressure current is distributed underground to five substations located at various points about the city, where the current is again transformed to 2200 volts for distribution for commercial use.

The present productive capacity of the three power houses connected by this system is 155,000 horse-power, power house No. 1 of the Niagara Falls Power Company producing 50,000 horse-power, power house No. 2 55,000 horse-power and the power house of the Canadian Niagara Power Company 50,000 horse-power. The installation in the American power houses consists of 10 and 11 generators, respectively, of 5000 horse-power each, and in the Canadian power house of five generators of 10,000 horse-power each. Two-thirds of the motive power used to drive the industrial and manufacturing institutions of Buffalo is now derived from Niagara Falls.

What is said to be the heaviest passenger engine ever built has been delivered to the Lake Shore & Michigan Southern Railroad. It weighs 244,700 pounds, of which 170,000 pounds are on the driving wheels. The engine and tender weigh 403,700 pounds and the capacity for water is 7800 gallons, while that for coal is 15 tons. This powerful locomotive was designed as a step in the development of large passenger locomotives on the Lake Shore road, which began about seven years ago, as a result of which this road has a series of successful designs. The Walschaert gear has been generally adopted because of favorable experience in both freight and passenger service. The new locomotive is entirely free from untried devices or principles.

At Sini, in western Bengal, a blast furnace and rolling mill plant is under construction which will have a capacity of 120,000 tons of pig iron and 70,000 tons of steel per annum. The Indian Government will build a railroad 500 miles long to connect the works with the Gurumaishini iron ore field. Construction work will be completed in about two years.

The Wills Steel Cars.

A new steel mine car designed by E. Cooper Wills of Bluefield, W. Va., and built by the Superior Supply Company of the same city, is illustrated in the accompanying Fig. 1. It is entirely of plate and structural iron construction, the sides and ends being of 3-16-inch steel and the bottom of ¼-inch steel, riveted together on the inside with 3 x 3 x ⅜ inch angle iron. The belts or binders are of 3½ x ⅝ inch iron and the bumpers are made of cast iron riveted to the car body. In these bumper castings are driven oak blocks for taking up concussion, the grain of the wood running endwise and being protected on the ends of shields, as shown.

Fig. 1.—The Wills Steel Mine Car Built by the Superior Supply Company, Bluefield, W. Va.

Fig. 2.—The Wills Contractors' Steel Rotary Dump Car.

One special feature of this car is the Wills equalizing brake, parts of which removed from the car are shown in the engraving. It consists of six working parts, these being two reversible brake shoes, a triangular center piece, the hangers and the pull bar, which is connected to the center piece. The shoes have a half round boss in the center that comes in contact with the triangle. For every inch the triangle is raised or lowered the shoes are forced to or from the wheels an inch, thereby equalizing and taking up the wear without any further adjustment. Through two openings in the triangle the center bolts on the shoes pass, which when the brake is released and the triangle drops down pull the shoes to a common center. When the brake is used on locomotives or cars, where it is fitted to only one wheel, a bracket is placed back of the triangle.

In Fig. 2 is shown a contractor's steel rotary dump car, also designed by Mr. Wills. The distance from the rail to the bottom of the car is less than 25 inches, making it easy to load. The center of gravity is sufficiently away

from the axles and back from the rails to insure steady running; yet the body of the car stands at an angle of 40 degrees when dumped. The crown plate revolves on rollers held in the spider plate. By pulling out the king pin the body of the car is easily removed, when by puting bolsters on two or more of these trucks long timbers or rails can be hauled. A wooden gate is used on the front end and the rear end has a steel door hinged to drop down. The lever attached to the crown plate has a pin connected to it that drops through both the crown plate and spider plate, keeping the car body in proper alignment. The pin rod just above it is attached to the car body and serves to hold it in the normal horizontal position. In operating the lever on the right is raised, the car swung to the point where the material is to be dumped, and the pin rod pulled out 5 inches, leaving the car body free to dump. All parts are evenly balanced and contractors state that they are able to get 10 per cent. more work done with this car.

The company also builds a steel car with drop bottom, which is not illustrated. This car is fitted with the Wills self oiling roller bearing wheels, in each of which are used 15 rollers ⅝ inch in diameter by 4½ inches long. Back of the rollers is a circular oiling chamber with ½ inch of metal between it and the rollers.

In this wheel at times the inventor makes use of a sleeve between the axle and rollers and also between the rollers and back wall of roller chamber, which takes up any wear by varying the thickness of the sleeves. When required any of the cars will be fitted with these roller bearing wheels.

Carbonic Acid as a Cause of Rust.

In view of the important place given to preservative coatings in the programmes of engineering associations and the divergent views on the causes and prevention of rust, interest attaches to the data presented by Gerald Moody of the Central Technical College, at a recent meeting of the Chemical Society in London. The accepted theory has been that the presence of oxygen and moisture would always cause rust, and the view of some chemists that carbonic acid played an important part in the reaction has been considered disproved by experiments carried on by Dunstan, Jowett and Goulding.

Mr. Moody, as reported by the London *Engineer*, held that minute traces of carbonic acid are sufficient to set up atmospheric corrosion, and he entered upon a series of experiments to justify his opinion. In these experiments extraordinary precautions were taken to exclude the minutest traces of carbonic acid. His plan was to keep a sample of highly polished iron in a few drops of distilled water for prolonged periods and to draw over it a continuous stream of air freed from carbonic acid by passage over caustic potash and soda lime. In some instances three weeks were expended in purging the apparatus of carbonic acid alone before the water was allowed to reach the iron, and for six weeks the pure air passed over the sample. At the end of this time the iron was as bright as when the experiment began. But, on the other hand, when air containing the normal quantity of carbonic acid was drawn over the sample, in six hours the bright surface was tarnished, and in 72 hours, during which time about 16 litres of air passed over it, "the whole surface of the metal was corroded and a considerable quantity of red rust had collected." The question presented by these experiments to the manufacturer of preservative coatings is how to exclude or neutralize the action of the carbonic acid carried by the atmosphere or by moisture.

Two correspondents of the *Engineer* comment on the above to the effect that there must be moisture to cause rust. One says that the experiments of the late Prof. Crace Calvert in 1869 to 1871 showed that with dry carbonic acid there was no oxidation, and that the most rapid corrosion took place when the iron was exposed to "damp oxygen and carbonic acid." The other correspondent says that in all cases of rust water as well as carbonic acid and oxygen must be present; that no oxidation can take place without water, though it has not been ascertained how much moisture must be present or the precise part it plays.

The Warren Foundry's Fiftieth Anniversary.

The Warren Foundry & Machine Company, Phillipsburg, N. J., celebrated its semicentennial with appropriate exercises June 7. The company was incorporated under the laws of New Jersey, March 3, 1856. The act of incorporation empowered the company to engage in the making of "stoves, steam engines, mill gearing, car wheels and all or any branch of the foundry business, and also manufacturing any and every kind of machinery." It is curious to note that cast iron pipes were not mentioned. It did not long continue to produce miscellaneous castings, as the originators of the company speedily perceived that operations of this kind were not attractively profitable. Early in 1857 the first pipe work was undertaken. In that year John Firth and John Ingham, two practical pipe founders, were engaged by the company and made cast iron pipe on contract from October 1, 1857, until May 1, 1866, during which time the Warren Foundry & Machine Company became exclusively a pipe manufacturing enterprise. The capacity of the plant steadily increased until it is now in a position to turn out 300 tons of pipe per day and employs 800 men.

Features of the Celebration.

The semicentennial of such an enterprise as this is a matter of no little moment both to those immediately connected with the company and to the iron trade at large. The event was celebrated in a most admirable manner. It consisted of several features. The employees were generously given a share in the day's celebration. The company closed the plant, but continued all wages, and further paid the expenses of the men and their families for an outing at Bellewood Park, 12 miles from Phillipsburg. The stockholders, their ladies and some guests were entertained at a banquet given at the company's plant, at which addresses were made. A souvenir of the occasion was prepared, consisting of a handsomely illustrated historical and biographical volume of 114 pages, most elaborately gotten up by Charles Francis Chidsey, one of the auditors of the company and son of one of its founders. A further memento was a paper weight, consisting of a brass base supporting a miniature length of cast iron pipe, which was presented to all who attended the banquet.

Testimonial by the Employees.

Prior to the departure of the employees for their outing an impromptu meeting was held, at which P. W. Walsh was elected chairman and Alfred Haley secretary for the occasion, and the following preamble and resolutions were adopted:

Whereas, This, the seventh day of June, 1906, has been set aside for the celebration of the fiftieth anniversary of the organization of the Warren Foundry & Machine Company; and whereas, we as employees have been invited to participate in the celebration, and through the kindness and generosity of the company are to enjoy an outing at its expense; and whereas, we accept with pleasure this kind invitation, recognizing as we do the kindly spirit in which it is extended, and in order that our appreciation of this and the many acts of kindness shown us by the officers of the company during our service with them may be properly expressed, we, the employees of the Warren Foundry & Machine Company in meeting assembled do herewith express our hearty and grateful appreciation of the generous and humane treatment accorded us at all times by the company and its officers, and renew our assurance of the esteem and respect in which we hold them, and on this their golden anniversary we greet them as follows:

Resolved, That we, the employees, herewith respectfully tender our hearty congratulations to the company and its officers on the great success achieved during the 50 years of its existence;

Resolved, That we acknowledge with pride the good feeling that has always existed between us and our appreciation of the kind and considerate treatment accorded us at all times by the officials is herewith expressed.

The Visit to the Plant.

A special train was provided by courtesy of the Central Railroad Company of New Jersey, which left New York at 9.30 on the morning of the anniversary day. This train took to Phillipsburg William Runkle, president and treasurer; William H. Hulick, vice-president

and assistant treasurer, and the company's employees in New York, together with invited guests, the party including a number of ladies. On arrival at the plant the first hour was given to an inspection of the offices and works. Opportunity was thus afforded to many who had never before seen the works to note their extent and the excellence of the equipment.

The plant occupies a tract of nearly 35 acres and includes 27 principal buildings. Six of these buildings are used for pipe foundries. The cranes in all these foundries are electrically operated, even including the jib cranes, which were at one time operated by hand. The newest foundry is served by overhead traveling cranes which span the full width of the building and run its entire length. In this foundry the casting and ramming pits are rectangular instead of circular in form. Electric rammers are used. The cores are turned by power and hoisted directly from the core carriages to the molds. The sand is handled by power conveyors and elevators.

After the inspection of the plant the stockholders and their guests were taken to the machine shop, which is a modern steel and brick structure 54 feet in width by 210 feet in length. It was found that this building had been arranged for a dining hall by the removal of the machines from the center of the building to the bays. This gave a clear space admirably adapted for the purpose, being not only under cover but at the same time well lighted and well ventilated. Long tables were arranged down the center of this space, with a table across it at one end for the officers. An orchestra placed on an elevated platform played popular airs during the dinner. The room was decorated with flags and bunting, interspersed with shields bearing the names of the founders of the company. The luncheon was unusually good and well served. The entire arrangements in fact were not only well conceived but splendidly executed, making the occasion highly gratifying to the officers of the company as well as thoroughly enjoyable to those who participated. Rev. Dr. Elliott C. Armstrong of Williamsport, Pa., grandson of a founder of the company, opened the exercises with prayer.

The Addresses.

Charles F. Chidsey, who prepared the memorial volume, also acted as master of ceremonies, introducing the speakers. After the conclusion of the dinner, with an appropriate introduction he presented the president, William Runkle. Mr. Runkle paid a high compliment to the loyalty with which those connected with the company had always served it. This loyalty extended throughout the entire ranks of the officers and employees of the company. In all the 50 years of its experience it had never had a strike. The company was not successful from its very beginning, but had quite a struggle to maintain its existence for the first few years. The success it has won since it turned its attention to pipe alone has proved the widsom of this step. Mr. Runkle gave a number of interesting incidents in connection with the progress of the company and stated that in 1900 the reconstruction of the plant was begun and this work is now nearly completed. It was a gigantic task but had been done without incurring a dollar of indebtedness, without soliciting a dollar of aid from the stockholders and without passing a single dividend.

The next speaker was William H. Hulick, vice-president and assistant treasurer, who spoke eloquently of the advances made in industrial matters within the 50 years covered by the company's existence. He paid a high tribute to the pioneers of the company, especially to Firth and Ingham, who really taught the founders of this country how to make cast iron pipe.

Russell C. Stewart of Easton, Pa., grandson of one of the founders of the company, took as his subject the general hostility now manifested against corporations. He pointed out the necessity of the existence of corporations in conducting vast transportation, commercial and manufacturing interests, claiming that without them the business of the world could not be conducted on the tremendous scale now necessary. He drew the conclusion that if all corporations were as well managed and attended as strictly and rigidly to their own legitimate business as the Warren Foundry & Machine Company the feeling against corporations would not be so widespread.

Other addresses were made by Rev. H. L. Bunstein of Milford, Del.; W. J. Crossley of Trenton, N. J.; Judge George M. Shipman of Belvidere, N. J.; John I. Blair Reiley of Phillipsburg; Edward J. Fox, A. D. Chidsey and J. Whit Wood of Easton and Geo. W. Cope of *The Iron Age*.

Letters of regret were read from Governor E. C. Stokes of New Jersey, President George B. Hayes of the United States Cast Iron Pipe & Foundry Company, A. H. McNeal, the veteran pipe founder of Burlington, N. J., and others.

Among the guests present were the venerable John Fritz of Bethlehem, Pa.; B. F. Fackenthal, Jr., president of the Thomas Iron Company; T. N. Jarvis, second vice-president; H. W. Middleton, third vice-president, and C. A. Blood, general traffic manager of the Lehigh Valley Railroad Company; E. M. Snyder, general freight agent of the Central Railroad of New Jersey; J. H. Heckman, retired, for many years general freight agent of the Lehigh Valley Railroad Company; M. J. Drummond of M. J. Drummond & Co., New York; Nicholas Engel of John Fox & Co., New York, and George Ormrod of the Donaldson Iron Company, Emaus, Pa.

More Chicago Blast Furnaces.—CHICAGO, June 12, 1906.—*(By Telegraph.)*—Two blast furnaces, having a combined capacity of 1000 tons daily, are to be erected by the Inland Steel Company, Chicago, at Indiana Harbor, Ind. These stacks will be built on a site of 50 acres recently acquired adjoining the company's present property. The acquisition of this land gives the Inland Company a lake frontage of nearly a mile, and ample facilities for docks, &c., for the unloading of ore boats. The steel producing capacity of one plant was recently increased to 500 tons daily by the erection of a fifth open hearth furnace and a sixth is under contemplation.

The first steel passenger car built by the Pressed Steel Car Company, Pittsburgh, has been sent to Atlantic City, where it is on exhibition this week at the national convention of the Master Car Builders' Association. The car was built for the Southern Railway and is 74 feet 6 inches in length, weighing 110,000 pounds. It is fitted with two sets of six-wheel trucks, each weighing 18,620 pounds. Among the passengers who made the initial trip on the car were: Charles A. Lindstrom, chief engineer; Clarence Postlewaite, manager of sales, and P. M. Kling, manager of the passenger department of the Pressed Steel Car Company; representatives of the Westinghouse Air Brake Company, Niles-Bement-Pond Company, and officials of the Fort Wayne, Pan Handle and Pittsburgh & Lake Erie railroads.

In using incandescent mantles for gas lighting it is usually found that illumination increases for a short period, after which a slow but steady fall sets in. The initial rise is credited to a gradual shaping of the mantle to the flame. The subsequent fall is attributed to two causes. One is that dust particles of silica are carried by the draft against the mantle, where they form, with the oxides, infusible silicates of low emissive power. The other, and more potent cause, is the gradual volatilization of the ceria, to which the incandescence is due. It is also found that the hygroscopic state of the atmosphere has a small but measurable influence on the luminosity of the mantle.

The Patterson Tool & Supply Company, Dayton, Ohio, and the W. M. Pattison Supply Company, Cleveland, Ohio, are suffering considerable inconvenience through misdirection of mail matter because of the similarity of their names, and request their correspondents to see that letters are properly addressed, so as to reach promptly the company for which they are intended.

THE IRON AGE

1855—1906.

New York, Thursday, June 14, 1906.

DAVID WILLIAMS COMPANY, ... PUBLISHER
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GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

The Labor Problem of the South.

With the tide of immigration to the United States sweeping on at its flood and with bills pending at Washington designed to make it more difficult for aliens to enter this country the South is pressing its labor problem on public attention with greater urgency. The Southern States Immigration Commission held a two days' conference in New York last week to discuss ways and means of increasing the supply of labor in that section through immigration, particularly in the interest of the Southern cotton mills. A bureau was established by the commission for the furtherance of its work, with headquarters in New York, and it will see that the inducements the South has to offer desirable immigrants are more generally made known in Eupore. The immigration officers at New York made it plain to the delegates to the conference that little is to be expected from attempts to divert to Southern points immigrants who come to the United States intending to settle in the Northwest or other sections.

A resolution that caused much discussion and that was sent to the Executive Committee called for an amendment to the immigration laws which would permit the importation of labor to the United States under contract, provided the contract wage be not less than the standard in the locality to which the immigrants are to go and the contract be filed with the Government at the port of entry. The resolution also declared inexpedient the proposals now pending in Congress to make an educational qualification for immigrants and to increase the head tax.

In the first place, in the present susceptibility of members of Congress to labor union influence there is small probability of any change in the law forbidding the bringing in of labor under contract. Existing public sentiment makes greater stringency rather than greater laxity the more likely prospect in the matter of immigration. It is a question whether the country needs to increase the stream of ignorant common labor now flowing so strongly through Atlantic ports. Moreover, it is time to consider whether the period of exploitation of the unparalleled natural resources of the country through the employment of a vast army of foreigners with strong arms and strong backs should not now give way to a period in which an increase of skill shall be the chief aim. The prodigal way in which natural wealth has been made available for use in the United States has led to an undervaluation of skill in handicraft. It would seem that the time had come for a better appreciation of manual dexterity for the larger and more thoroughly economical development of our industries.

In part the labor problem with which the South now has to deal is that which troubles other sections as well. There is a scarcity of labor in nearly all parts of the country and in nearly all employments. In the succeeding period of more normal business less will be heard of the proposals now agitated for the stimulation of immigration. But complaints of inefficient negro labor, of an inadequate supply of cotton mill workers and of lessened output, due to the effects of climatic conditions, will long continue in the South. Some of the Southern industries are still in their early stages and high grade mechanical skill is not bid for as it may be later. Mining, work in the field, on water power development, on railroad building and various public improvements, together with the commoner forms of labor in coke making and iron making, call for a larger percentage of unskilled labor perhaps than is considered desirable in the North. But it will be a long time before the place of the negro in these employments will be taken by considerable numbers of Italians or any other of the classes of foreign labor which it is now desired to interest in settling in the Southern States.

Notoriously the negro workman of the South is spoiled by prosperity. Advancing his wages has generally the tendency to make him more of an idler, since at higher wages his wants are supplied by fewer days of labor. The cheap labor of the South, of which much was heard in the early days of iron manufacture there, has been proved to be a myth. Southern labor has never been cheap when measured by its productive power. A further handicap, and one that will always exist, is found in climatic conditions. Northern men going into the South to take managerial or engineering positions in the iron trade testify to the enervating effect of the climate. Not only must the manager trained in the North draw on his energies to bring his men up to a fair performance, but he must fight the deadening effect of the Southern pace and the Southern atmosphere upon his own ambition. Eventually in nine cases and perhaps more out of ten the Northern pace gives way.

Machinery will be employed to an increasing extent in the South for the solution of its labor problem. It may be that in spots Italian and other foreign labor may be introduced, to the exclusion of the negro in these particular localities. But the causes which led to the introduction of the negro in the South will continue to operate for his retention, and in the iron trade there will always be the offset of high unit cost for labor against the advantage of almost limitless resources in raw materials.

The Sheet Trade.

In the present era of rapid expansion of iron and steel production, to which the current year will undoubtedly add another stirring chapter, the line of sheet products is making its full contribution to the general tonnage. The shipments of such products, including tin plates and black and galvanized sheets, of the leading interest during the first five months of this year were 50,000 tons in excess of similar shipments in the first five months of last year.

This record is of much greater significance than the bare numerical comparison indicates, for several reasons. At the beginning of 1905 there were stocks of considerable magnitude at the mills; at the beginning of the present year there was practically none. During the first half of last year consumers laid in stocks of importance; at the present time they are clamoring for deliveries, which are weeks behind. About the middle of last year a great many sheet and tin plate mills were closed, not to resume operations until late in the year. This year, through current conditions, the prospects are that production will be as heavy in the second half as in the first half, and in the third quarter almost as heavy as in either of the first two quarters.

The fact cannot be denied, however the condition may

have been brought about, that there has been an actual scarcity of sheet and tin plate bars pretty steadily since the beginning of this year. If the supply is better in the third quarter, as is promised, the production of tin plate at least will be at a greater rate than it is at present, since lately the leading interest has had mills idle which are counted upon for steady operation in ordinary times. The Sharon mill has been down and portions of the Laughlin and American works, making a total of nearly 50 tin mills, besides a number of plants which are regularly operative but only run in times of great demand. It is to be presumed that the recent high market level of pig tin has had something to do with deferring to the last possible moment the manufacture of tin plate, which makes the present situation diametrically opposite to that of the past two years, in which years the first half made much tin plate which was stocked at one point or another and consumed in the second half.

The independent sheet and tin plate manufacturers have not suffered to any greater extent than has the leading interest from the scarcity of steel, and their prospects for continued operation during the balance of the year are equally good. Current market prices have not been altogether satisfactory to them, on account of the higher price of steel in the past two months but as they do not sell their products so far ahead as does the leading interest, so they can the sooner reap the benefit of the successive advances in prices of sheets and tin plates which have been taking place this year.

The price of tin plate as advanced to $3.75 May 18 is a fair one relative to steel and pig tin. A comparison can be made with recent low points. On July 25, 1904, tin plates were reduced to $3.30, at a time when sheet bars were $24 and pig tin was 27.10 cents. Comparing these with $3.75 for tin plates and $28 for bars, it can be figured that the manufacturer could afford to pay about 39 cents for tin. On October 2, 1905, tin plates were again reduced to $3.30, when sheet bars were $26, and making a similar comparison it can be shown that the manufacturer could afford to pay 49 cents for tin and be on the same basis.

It can very safely be said that not for years has the month of June been entered by the sheet and tin plate trades with prospects more favorable as to both production and prices. It had become almost the regular thing for both sheets and tin plates to drop in price in midsummer, but there are no such prospects this year.

The leading interest's production of tin plates and black and galvanized sheets in 1905 was 925,000 gross tons, against 700,000 gross tons in 1902. The present prospects are that its production in 1906 will easily be 1,100,000 gross tons.

The use of sheets is extending very rapidly. The electrical industry now consumes between 80,000 and 100,000 gross tons of electrical sheets annually, against a negligible tonnage only a few years ago. Metal lathing is becoming a very important tonnage producer. Its advantages as to stiffness, ease of application and noninflammability were early recognized, and there is the additional incentive to its use furnished by the fact that wooden lath are now charged for on the basis of a regular lumber product. Before the wood pulp industry reached present proportions the country was supplied with lath made from pieces which had no other application, but the pulp industry now absorbs such material and lath bring a price as a regular merchantable lumber product.

The use of sheets in the manufacture of cases of various descriptions has been growing very rapidly in the past two years. Cases for bottles, particularly beer bottles, are made from sheets and give great satisfaction.

It is noticed every time there is pressure for delivery of sheets that the mills become farther behind on galvanized than on black sheets. Manufacturers assert that this is because they seem never to be able to keep up with the demand for galvanizing. They are continually increasing their galvanizing capacity, but more and more of the total sheet product is required to be galvanized.

The Cast Iron Pipe Industry.

The celebration of the fiftieth anniversary of the establishment of the business of the Warren Foundry & Machine Company, Phillipsburg, N. J., which occurred during the past week, directs attention to the cast iron pipe industry, in which this company takes a conspicuous part. We have to-day a large number of foundries making a specialty of the manufacture of cast iron pipe, and their annual output is rapidly approximating 1,000,000 tons. So large an output makes this industry a very important branch of the iron trade.

It is quite interesting, in view of the foregoing, to note that the cast pipe industry is of comparatively modern origin. Its beginning is involved in some little obscurity. The earliest reference to the industry in this country appears in Bishop's *History of American Manufactures*, in which the statement is made that the first extensive or successful use of iron pipes in the United States was made about 1822, in the service of the Fairmount Water Works, then being erected in Philadelphia. The pipes, he says, were cast in that city, in "sections of 9 feet in length and 2 to 22 inches in diameter, upon the plan furnished by Mr. Walker, engineer of the New River waterworks, near London, where cast iron pipes were in successful use." He adds that about 30,000 feet of pipe and 3000 to 4000 joints of peculiar construction were laid, and the Schuylkill water was introduced into 3945 private dwellings, 185 manufactories and 401 private baths in Philadelphia. It is possible that these pipes were cast at the Pascal Iron Works, although no specific information is given on this point.

Another reference to the pipe industry is made by Bolles in his *Industrial History of the United States*, published in 1881, in which he says that "the manufacture of iron pipes took its rise about 1835 and was essentially the outgrowth of the business of supplying cities and villages with water and gas." Many of the works which then engaged in manufacturing pipes, however, had been founded long before 1835, as, for instance, the Bridgewater Iron Company, in Massachusetts, which started in 1810; the Pascal Iron Works, in Philadelphia in 1821, and the Camden Iron Works, in Camden, N. J., in 1824, but these works had been established to manufacture other iron products, such as stoves and general castings.

Undoubtedly the early manufacturers of cast iron pipe did not find the business particularly profitable or desirable. The demand must necessarily have been spasmodic, as the introduction of waterworks into towns was of slow growth, and the introduction of the manufacture of gas for illumination was likewise a very gradual process. From these two sources of demand came the trade in cast iron pipe. The pioneer manufacturers of this product therefore not only had to meet with conditions which forbade exclusive attention being given to this industry, but at the same time they were compelled to contend with foreign pipe, manufactured in England or Scotland, for which contracts were often made when a very extensive piece of work in laying pipe was contemplated by cities or towns, especially those located near the seaboard. It is consequently interesting to note

that as early as 1857 the Warren Foundry & Machine Company decided to embark exclusively in the manufacture of cast iron pipe. The industry has grown wonderfully since then, but at no time has it made such tremendous expansion as during the past three or four years.

A Contrast in Trade Policy.

Two recent developments, one in Canada and one in Great Britain, but both relating to Canadian trade and industry, are of interest. We refer to the proposal of the Board of Trade of London to send a commission to Canada to investigate the competition which British manufacturers have to meet in that market and to the petition presented to the Dominion Government by the Canadian Manufacturers' Association asking for a commission to report on a national system of technical education. Both movements are significant. In connection with the tardy thought of a British commission to Canada it comes out that Great Britain has not a single representative in Canada on commercial matters, while it is stated that other countries have nearly 400 consular officials there, of whom nearly half are in the employ of the United States Government. It seems almost incredible that Great Britain should have omitted for so long to take practical steps looking toward the furtherance of her trade in Canada, whereas Germany, with 16 consular representatives at Canadian points, is now considering whether the time has not arrived for a commercial understanding with Canada. The ties of blood fare hardly under the strain of modern competition.

The petition of Canadian manufacturers on technical education looks to the Government furtherance of a system of technical training as part of a comprehensive plan for the better development of Canadian resources. It is pointed out that while the Alien Labor act prohibits the bringing into Canada under contract of technically trained men from the United States, no serious effort is made to furnish an adequate supply of Canadian experts. It is well known that the statute has not prevented the manning of important industries on the other side of the border with American engineers and managers; but with the growing sense of industrial importance that has taken hold of the Dominion much more is heard of Canada for Canadians as the rallying cry of the new movement. Indeed, national aid of technical education is urged as an essential part of a scientific tariff policy. It may be noted in this connection that the paternalistic spirit across the border grows by what it feeds on and that its waxing is contemporaneous with the growth of the opposite spirit in the United States.

The two developments referred to in the foregoing suggest that Canadian anticipation of a greater industrial position and preparation for it have been as marked as the failure of Great Britain to recognize the real meaning of the Canadian movement in its effect upon British commercial prestige.

The American Foundrymen's Association.

Small appreciation has attended the work the American Foundrymen's Association has been carrying on for a number of years in the interest of improved methods in the foundry and a better knowledge of the behavior of cast iron. But the Cleveland meeting of last week developed an unsuspected interest and surprised even the most sanguine of the officers of the association with an attendance running well above 800. For several years the membership of the association has been about 300, but with the additions made at Cleveland, and the active campaign for new members that will be undertaken in the coming year, it is predicted that the association will be made stronger than ever. Labor questions have been so absorbing in late years that the educational movement has been left to the efforts of a few, the burden falling almost entirely on Secretary Moldenke. His persistence and devotion in the face of the apathy of many manufacturers now seem in a fair way to bear fruit, and the foundry trade at large will be the gainer.

CORRESPONDENCE.

The Advance to Pacific Coast Molders.

To the Editor:—We note that *The Iron Age* is keeping its readers in close touch with the progress of the molders' strike and we believe it will be of interest to you to know the development of this trouble on the Pacific Coast; in fact, we strongly feel that the recent action of the Pacific Coast foundries in conceding such liberal terms to their molders should be explained so that it will not be misinterpreted by the Eastern foundrymen.

The foundry conditions of the Northwest have for years shown little indication of any particular change, there having been no cause for disagreement between the foundrymen and their molders, except from the fact that the foundrymen have always paid higher wages to the molders than was compatible with the interest and growth of the Northwest shops.. This was apparently due to the fact that there were far fewer competent molders on the Pacific Coast than the amount of work warranted. This Coast has practically been paying a minimum of $3.50 to all molders and has been pretty closely tied down as regards union restrictions, for the simple reason that the men already here took good care to see that very few additions were made to their ranks from the East; and as their restrictions on apprenticeships were unduly narrow, the additions to the molding force of the Pacific Coast have not kept pace with the demands for this class of skilled labor.

Therefore, when this year showed more than usual activity, the molders considered it a favorable opportunity to make one more turn of the jackscrew by demanding a minimum wage scale of $3.75 for nine hours' work, which represents a raise of 25 cents for the day's labor, as the shops had already been on a nine-hour day for several years. Considering the fact that the living conditions and the opportunity for steady employment are exceptionally favorable in this locality, this was an unreasonable and exorbitant demand and every shop in this city refused to accede to it. In consequence the foundries were partially tied up about the middle of May by having all men who were not receiving $3.75 leave their employ. Evidently the molders had no sanction for this except their own local action, and they proclaimed that it was no strike, but just a legitimate effort to better the condition of the $3.50 men. This left all the shops running but with their output greatly crippled by having only the $3.75 men at work. Evidently sanction was secured from the general union headquarters to proclaim a strike on the basis of $3.75 minimum, and the men announced that unless we would admit that such a minimum was in force there would be a general strike. Our inability to admit anything of the kind caused such a strike in this city on June 4.

In matters of labor difficulties this city is in a peculiar position, for the reason that it is between San Francisco and Seattle and Tacoma on the Sound, and if both of these districts offer any exceptional inducements to labor it leaves Portland in the plight of either allowing similar concessions or being crippled in the output. In this particular case San Francisco, on account of the recent destruction of the city and the great demands made upon the foundries which were not destroyed, had already conceded the $3.75 minimum, but the Northern cities had decided to grant no such demand. Later on, however, it developed that some of the foundries in Seattle in their desire to get men had fallen into

the error of offering additional inducements to take men away from each other until a condition was reached in which although the claim was made that $3.50 was the minimum wage, yet no molders received less than $3.75. As the result of this, coupled with the great scarcity of molders on the Coast, the foundries of Portland and Tacoma were unable to make any substantial headway in holding out against the demands of the union. So long as the cities to the north and south of them had conceded the demands and offered a sufficient field of labor to largely absorb the available stock of Pacific Coast molders, it put us in the predicament of either making a similar concession or else being unable to complete our contracts.

The result is that the whole Pacific Coast is practically working on a $3.75 minimum wage scale for molders, with a demand for a great many more molders in the most attractive labor market in point of climatic comforts and reasonable living expenses that was ever offered to the American mechanic. It is therefore our strong hope that among the large number of citizens who are looking toward making the Pacific Coast their ultimate home there will be a substantial number of high grade molders, so that the country may take care of its greatly increased business activity. In fact this particular city, in view of the decision of the Northern Pacific and Great Northern railroads to make Portland their most important Pacific Coast terminal, has the assurance of being the northwest terminal of all four of the great transcontinental roads. This gives it a commercial importance which will make its demands on the labor markets of the United States much greater than they have been in the past. I. W.

PORTLAND, ORE., June 5, 1906.

The Government Armor Factory Again.

WASHINGTON, D. C., June 12, 1906.—The Secretary of the Navy has appointed a board, composed of Capt. Kossuth Niles, Commander Walter McLean and Lieutenant Commander Simpson, to make an investigation as to the cost of producing armor plate at the present time and more especially the cost of constructing an armor plate plant. The board has been instructed to hasten its work, and is now preparing to visit the plants of the Carnegie, the Bethlehem and the Midvale steel companies, for the purpose of gathering data, in the expectation of submitting a report within 30 days.

House Calls for Information.

The action of the Secretary in appointing this board is the result of a resolution adopted by the House of Representatives on the 5th instant requesting a report of all the information secured by the Navy Department in pursuance of the requirement of the last Naval Appropriation act calling upon the Secretary of the Navy "to make a thorough inquiry as to the cost of armor plate and an armor plant." The act referred to was passed March 3, 1905, but until recently the requirement with regard to the armor plate investigation had received no consideration at the hands of the Secretary of the Navy. During the framing of the Naval Appropriation bill which has just passed the Senate Admiral Mason, chief of the Naval Bureau of Ordnance, was questioned by members of the House Naval Committee as to the progress made in the preparation of the armor plate report, and frankly stated that the matter had received no attention. The Secretary of the Navy immediately appointed the special board named above, and the work of investigation was at once begun. Following Admiral Mason's statement before the committee a resolution was reported to the House and adopted again calling upon the Department for the desired information.

The purpose of Congress in suggesting the construction by the Government of an armor factory at this time is not clearly understood by the naval authorities. At the present time the Government is enjoying the advantage of genuine competition on the part of armor manufacturers, the Midvale Steel Company now being engaged in delivering armor under a contract at the rate of $398 per ton, while the Carnegie and Bethlehem companies are furnishing similar plates at $420 per ton plus a royalty, which makes the total difference in favor of the Midvale Steel Company about $45 per ton. Members of the House Naval Committee, however, have suggested that when the Midvale Steel Company's present contract has been completed and its ability to manufacture high class armor plate has been fully demonstrated it may increase the price if it does not join the combination alleged to exist between the Carnegie and Bethlehem companies.

Viewed from the Investment Standpoint.

It is urged that if the Government should build an armor factory it would be a good investment even if it were not operated, as it would serve to keep the price down and in an emergency might be used to supplement the work of private contractors. But naval experts point out in this connection that the present conservative policy of Congress in appropriating for armored war vessels will not supply the tonnage necessary to make a Government factory practicable from an economical standpoint. The interest on a Government plant costing $4,000,000 at only 2 per cent. would be $80,000, while the depreciation would be much greater. It is the declared policy of Congress to authorize the construction of but one heavily armored war ship per annum, which would call for only 3000 or 4000 tons of plates. If the Government made these plates it would not keep an economically designed plant busy, while if the plant should be maintained solely for its influence on the price of armor it would be necessary to cut present prices $100 per ton or more in order to cover interest and depreciation.

The present outlook for the armor plate makers is not very encouraging. The only requirements in sight are those of the South Carolina and Michigan, authorized by the naval appropriation act of March 3, 1905, for which an aggregate of 7388 tons will be needed. The current appropriation bill now in conference authorizes a single battle ship of greater tonnage than any heretofore built for the United States Navy, but the Senate, feeling some doubt as to the practicability of this project, has added an amendment requiring the Secretary of the Navy to submit the plans of the proposed vessel to Congress next December before entering into a contract for its construction. It is therefore uncertain whether this vessel will be authorized.

The special Armor Plate Board will adopt as part of its conclusions the findings of the board appointed by the direction of the Fifty-fifth Congress, which made a most exhaustive investigation of the subject and submitted voluminous drawings and specifications for a Government factory. The details were published in *The Iron Age* at that time.

At this writing it seems hardly probable that the special Armor Plate Board just appointed will complete its work in time for its report to be transmitted to Congress before adjournment for the summer recess. It is possible, therefore, that the information that will be laid before the Secretary of the Navy in a few weeks may be supplemented during the recess and a more comprehensive report sent to the House next December. In any event it is not likely that there will be any legislation on this subject before the next annual appropriation bill is framed next January. W. L. C.

Preliminary estimates of the foreign commerce of the port of New York, made on Monday, indicate that the volume of transactions for the fiscal year ending June 30 will be the largest in the history of the Custom House. Auditor Knapp states that the total commerce of the port will aggregate $1,275,000,000, compared with $1,189,000,000 in the fiscal year 1905. In the past 15 years exports at New York have increased 50 per cent., while the imports are greater by over 31 per cent. It is expected that the imports at New York for 1906 will possess a value of $735,000,000 and the exports $580,000,000. This fiscal year the Government will have collected at New York nearly $180,000,000 in duties. The next port to New York as a revenue earner is Boston, where $25,000,000 has been gathered into the Federal treasury the past 12 months.

Independent Ore Companies Active.

Purchases of Mines and Exploration for New Deposits.

DULUTH, MINN., June 9, 1906.—The ore movement is tremendous and gaining in volume and speed weekly. It has always been the fear that the two Minnesota roads owned by the United States Steel Corporation would operate to the advantage of that company and sidetrack or delay, when convenient, outside and independent shippers. That this is not the case is a matter that is now causing much favorable comment. In the case of the Duluth, Missabe & Northern there might be more excuse for such action than with others, so enormous is the tonnage it is handling for its owner in the short season—10,000,000 tons—and so vast is its expectation of total business. Eleven million tons of ore moved in a single season by one road is a total large enough to stagger the imagination.

No. 1 ore dock of the Great Northern road, which was built in 1892, is to be torn down and rebuilt larger and higher the coming winter. It has a capacity for 40,500 tons in 250 pockets, is 1525 feet long and 57 feet high. Its companions, owned by the same road, are 73 feet high and more than double that capacity. When rebuilt it will be as large as No. 2, which is one of the greatest and fastest ore piers in the world. Work on all ore piers for this season's business has been seriously delayed by the lack of material. None of the new docks is ready for traffic. Even that of the Milwaukee road, which was begun in September last year, is incomplete. The great No. 4 dock of the Duluth, Missabe & Northern, which is to be the largest ever built, with a capacity of 119,000 tons and a length of 2304 feet, will be ready for ore in a few weeks. This dock with approaches is costing about $500,000.

All of the independent companies are active this year, more so than at any time in the past. This is shown by the number of mines they are buying and by their exploration for new deposits on all ranges. In addition to such large concerns as Pickands, Mather & Co. and Shenango, who have been in the field for several years and have gathered a goodly supply of ores, there are the Consumers' Ore Company, which is M. A. Hanna & Co.; the Lake Erie Ore Company, which is Drake, Bartow & Co.; the Chicago Ore Company, the Rhodes Mining Company, the Winnifred Mining Company and numerous others, all representing steel making concerns of more or less prominence. Other small concerns, either branches of steel makers or independent miners, such as the Florence and the Dessau, are as active in extending their operations as the newer companies, and all with the same idea, that ore is scarce and growing scarcer and that it is pretty thoroughly taken up by the big consumers, who will not sell, so that the smaller companies must either do business in ore or be prepared to stop making steel.

The Shenango and Rhodes Operations.

The Shenango Furnace Company is to ship a far larger tonnage of Mesaba iron ore this year than ever. Its Shenango mine will produce about 400,000 tons, and its new Webb mine 200,000 tons. The Shenango lies in section 23-58-20, and the Webb in section 6-57-20. Both are large deposits, though the Webb is not quite so desirable as the other. The company has expanded also in other directions, and now has a vessel tonnage of large and modern steel ships that will take care of a large share of its annual shipments. Shenango mine is served by the Duluth, Missabe & Northern road, and Webb by the Great Northern.

Very active operations are under way by the Rhodes Mining Company, which is the western branch of the Cherry Valley Iron Company, and of which Alexander Maitland is head. The company has the Nassau, Brunt and Hobart for new mines, as well as the various properties it bought from the Sellwood and other interests. A railroad spur from Great Northern lines is being built to Nassau. At the Brunt, which lies in section 10-58-18, a shaft has been sunk and developments underground are in rapid progress. The mine is quite dry, and a large amount of ore, estimated by the management at 100,000 tons, will be moved this year. This will be an exceptionally good record for a new underground development. The Hobart is much more difficult to open, as it is very wet, and two 125-foot vertical shafts with little lateral development have been making up to 3000 gallons a minute. The company will make a very large shipment from its group of mines this year, especially from La Rue. It has a large tonnage for reserve, and several of its mines, especially La Rue and Croxton, have very fine ores.

Pickands, Mather & Co., who own in part and operate the Sunday Lake and Brotherton mines at Wakefield, Gogebic range, have started important betterments there. A large four-compartment shaft at Brotherton, fitted with two skipways, a manway and pump compartment, will be driven steadily in the foot wall rock, and should be completed in about two years. This will increase the possible shipments, and will release a considerable tonnage now not available. Sunday Lake is to have a big triple compound pump to lift 1000 gallons a minute, also considerable new equipment on surface. At Brotherton there are new compressors and a larger drill capacity. The two mines will ship a larger tonnage than in 1905, when they produced 216,500 tons.

At other points on the Gogebic developments are in progress that will have great bearing on the future of the district. Reference has been made to the new steel shaft in the foot wall of Montreal and to exploration west of Upson. Drilling is in progress from the bottom of Tilden, and this has located the main Colby vein 1100 feet from the surface and 500 feet from No. 6 shaft. This discovery practically insures the future of this almost abandoned mine. Tilden had dropped from 500,000 tons a year to less than 200,000.

Washing Sandy Mesaba Ores.

Experiments in the washing and mining of soft, sandy ores of the western Mesaba are still in progress, and the Oliver Iron Mining Company has ordered a lot of machinery for working these ores. It expects to mine and ship 1,000,000 tons a year or more from one location on the western Mesaba. Every device for handling these ores, both for mining at low cost and for concentrating, is being tried, and without doubt the results will prove exceedingly valuable to all mining men interested in moving and dressing ores on a large scale. Some very interesting new devices for mining may be adopted in this district, and if they prove successful methods of stripping, depths and the general handling and removal of earth and ore may be revolutionized.

Three steam shovels are stripping the Stephens mine on the eastern Mesaba, where developments have been in progress for several years. The mine has been developed in a model way for a very heavy output, but it only produced 87,000 tons in 1903 and 367,000 in 1905. It is capable of an annual product of more than 1,000,000 tons, and so large is the ore deposit that this can be maintained for much more than a generation. The royalty is low, 15 cents a ton, which may account for the slight output so far. The annual stipulated minimum is 100,000 tons, and this has been paid for the past eight or ten years, with a production in that period of only 450,000 tons.

D. E. W.

A development of interest in the international rail trade is the taking of a contract for 15,000 tons of rails for Mexico by the Glengarnock Works in Scotland. The London *Ironmonger* says the contract was taken at a very low price and that this has brought about some friction between the works named and those included in the British Railmakers' Association. "It seems that there was an informal understanding between the Glengarnock Works and the Rail Association regarding prices. The latter appear to have understood the agreement to refer to both home and export business, while the Glengarnock Company interpreted it as applying only to the home trade. In the meantime the order has been booked and there is very little doubt that it will be executed."

New Publications.

The Manufacture of Concrete Blocks and Their Use in Building Construction. By H. H. Rice, secretary the American Hydraulic Stone Company, Denver, Col.; Wm. M. Torrance, assistant engineer, Hudson Companies, New York, and others. Publishers, the Engineering News Publishing Company, New York. Cloth, 6 x 9 inches; pages, 122; illustrated. Price, $1.50.

While there is a large amount of printed matter available in books and technical periodicals dealing with the use of reinforced concrete there has been little pertaining specifically to concrete block construction. Appreciating the need of literature on this subject the *Engineering News* and *Cement Age* jointly offered prizes of $250 and $100, respectively, for the two best papers dealing with the manufacture and use of concrete blocks. This book contains the substance of the results of the competition, the first and second prize papers being printed in full, with abstracts taken from some eight or nine others to supplement the information contained in the prize papers. The abstracts have been grouped by subjects rather than authors, so that a consensus of opinion will be found under each heading with regard to that particular point. The papers and abstracts together form a practical treatise on a heretofore neglected subject that will be of unquestioned utility to designers and engineers interested in this form of construction.

The Manual of Statistics, 1906.—Pages 1056, 5½ x 8 inches. Price, $5. Published by the Manual of Statistics Company, New York.

This well-known stock exchange handbook has reached its twenty-eighth annual issue. It presents full and yet compact information in regard to railroad and industrial corporations, with quotations for securities in the New York, Boston, Chicago, Philadelphia and other markets, and statistics relative to cotton and grain. There is also a directory of banks at leading cities. Many valuable maps of railroad systems are given, and the information is marked by accuracy and completeness.

Twenty-third Annual Report of the Board of Railroad Commissioners of the State of New York.

Two stout octavo volumes, with a total of 2783 pages, contain the report of the Railroad Commissioners of New York State for the calendar year 1905. A summary of the statistics contained in this report has already been printed. An important feature is the statement of the Railroad Commissioners' work in the elimination of grade crossings. From the beginning of 1899 to the close of 1905 151 grade crossings of steam railroads have either been changed from grade or the crossings closed. Photographic reproductions are given showing the structures erected in the elimination of a number of crossings. Accompanying the report is an excellent railroad map of the State of New York, and as an appendix to Volume 1 the laws of the State relating to railroads are given in full, with index. Volume 2 is given up to reports of railroad companies for the fiscal year ending June 30, 1905, and statistical tables compiled therefrom. In discussing the accidents for the year on steam surface railroads the report says that while the number of accidents may increase one year over the preceding year, and while 1906 compared with 1905 may show such an increase, yet, in view of the larger number of trains being run and the increase in passengers carried and in population, it is evident that improvements in railroad construction, equipment and operation are preventing accidents. The statistics of last year seem to point to this. The total number of persons killed in 1905 was 903 and of injured 1961. In 1904 the number killed was 952 and of injured 2399.

An independent union of machinists made up of men who have withdrawn from the International Association of Machinists has been organized recently in New York City.

An American Manufacturer's Observations in Germany.

Charles A. Schieren, Jr., of the firm of Charles A. Schieren & Co., manufacturers of leather belting, 37 Ferry street, New York, has just returned from a European business trip which gave him an excellent opportunity of studying conditions on the Continent, especially in Germany. In fact, almost all of Mr. Schieren's time was spent in Germany, which is due to the fact that the large European business of his firm is handled through a principal branch located at Hamburg. From this distributing center business is transacted with 21 minor agencies, distributed throughout the industrial centers of the Continent and Norway and Sweden. These are located as follows: Germany—Breslau, Cologne, Hagen (I. W.), Hof (I. B.), Gladbach, Mannheim, Mulhausen (I. E.), Munich, Quedlinburg, St. Johann, Schwenningen, Stuttgart; Russia—Moscow, Warsaw, Lodz; Hungary—Budapest; Roumania—Bukarest; Norway—Christiania; Sweden—Stockholm; Italy—Milan.

Mr. Schieren said:

"Germany is in a very prosperous condition. Every line of industry is extremely busy and all enterprising manufacturers are reaping a rich harvest in the way of profits. Concerns which seven years ago, when I made my last previous trip abroad, were having a hard time to make both ends meet, last year declared dividends of 20 per cent. and upward. Not only are German manufacturers busy caring for their own trade, but they are making vast strides in reaching out for the markets of the world. They are directing very energetic efforts in the direction of the Far East. Several of the well-known machinery houses who handle American machinery very extensively are opening branches in Japan at present. The German manufacturer is even gaining a strong foothold in England and her colonies. This is very noticeable at present in the case of India.

Large Russian Business.

"In Russia Germany is doing a tremendous business. She made immense profits there during the Russo-Japanese war, chiefly because her manufacturers took chances, so far as payment is concerned, when Russia was financially discredited. Now she continues to reap the benefit of these risks, which have terminated most successfully. Russia is now buying great quantities of machinery and mechanical supplies and it is in Germany that the purchases are being made. Many of the large Russian houses now have accounts with German bankers, and all risk has been eliminated, as payment is made with draft on Berlin. Russian plants which were closed down during the war are now regaining their foothold and are rapidly becoming rejuvenated. The Russian Government is a very heavy customer, and every indication points to a very much greater activity in this direction.

"There is certainly a great market for American manufactures in Russia, but I am inclined to believe that the best way of supplying it at present is through Germany. This theory is based simply upon the strong foothold which German merchants have gained, and applies to immediate business. I believe that Russia will buy a great deal directly in this country as soon as American houses are in a position to go after the business and take care of the demand. Naturally, Germany cannot continue to satisfy all of Russia's enormous consuming power, for her requirements are growing rapidly as the work of reconstruction progresses. German manufacturers and merchants, being so much closer to the scene, have much better facilities of knowing who's who in Russia than the American trader; hence the seller on this side of the water should be extremely careful concerning the matter of credits. It is safe to deal only with the largest houses and there will be enough business from such reliable sources to satisfy the conservative American manufacturer. The present internal political disturbances of Russia are not having an adverse effect upon the industrial rebuilding of the country. It is rather but another phase of the great work of reconstruction in progress throughout the empire. Meanwhile Germany is keeping very

close watch upon the development across the border and is very keen in availing herself of the slightest advantage.

Progress of the German Manufacturer.

"The progress which the German manufacturer is making in every direction is astonishing. This enterprise is being encouraged by the Emperor, who is using his influence to better the position of the captains of industry socially as well as industrially. The young men of Germany of the better class are showing a keener interest in manufacturing. Many of these, who were sent abroad several years ago for a business education, have now returned and they are potent factors in their country's industrial and commercial advancement. Numerous Germans who came to this country eight or ten years ago learned American ways and accumulated a little wealth, and are now employing both to good advantage back in their Fatherland. The predominating influence of the large agrarian population of Germany is rapidly waning.

"Hamburg is a model city in every way and the impression it made upon me was certainly most favorable. With its Alster system of lakes right in the heart of the city it is ideal, so far as health and beauty are concerned, and assuredly unique as a great commercial center. Its independent form of government is excellent and the administration of public affairs is surely in good hands. The shipping facilities are fine, its steamers connecting it with every corner of the globe. This is a subject, however, on which much might be said that would show Germany to be far in the lead of our own country. Just as an instance of this I might state that this morning we are sending a large shipment to Bombay, but we are sending it via Bremen, finding that we save at least two weeks and some money by choosing this route in preference to direct steamer from New York.

"On the tariff question I think that the United States ought to reciprocate with Germany on certain lines and do all in its power to encourage a strengthening of the commercial ties binding the two countries. I would regard a trade war between the United States and Germany as one of the most disastrous things that might possibly happen to us. Just see what the Russian sugar fiasco did to our trade with that country while it lasted."

Trade Publications.

Machine Tools.—The Bullard Machine Tool Company, Bridgeport, Conn. Catalogue A 12. Size, 7 x 9 inches; pages, 64. Divided into three sections, pertaining respectively to standard boring and turning mills, rapid production boring and turning mills, and turret machines, both vertical and horizontal. The standard mills are so designated because they are intended for general machine shop work. The rapid production mills, as the name implies, are capable of greater capacity, hence have greater power and rigidity. Following a general description of each type alternate pages contain half-tone illustrations of the various sizes with descriptive specifications on the facing pages. A few examples of motor drive are included. The catalogue throughout deserves commendation incidentally for being a high class example of the printer's art, but more particularly for the thoughtful way in which it has been compiled with a view to rendering real information readily accessible.

Steam Pumps.—Marsh Steam Pump Company, Battle Creek, Mich. Illustrated catalogue, No. 14. Size, 6½ x 7½ inches; pages, 136. This is a comprehensive catalogue of the Marsh steam pumps adapted for all duties. The features in this line to which special attention is directed are the patent self governing steam valve and the absence of all outside valve gear. The difficulties of preparing a catalogue on so extensive and varied a range of product have been admirably met. Careful consideration has been given to conveniently presenting the subject matter by classification. An index at the front locates instantly any desired part, and the body of the booklet is divided into sections, dealing respectively with Standard boiler feed pumps, tank and vacuum pumps, air compressors, deep well pumping engines, pumps for handling the hot water of condensation, pumps for sugar house work, Marsh sinking pumps, Marsh creamery pumps and miscellaneous pumps. Lists and detail tables have been carefully arranged in convenient form for reference and comparison, and useful information is added in appropriate places. A smaller pamphlet from the same company is devoted to Marsh deep well engines and pump cylinders.

Steel.—Colonial Steel Company, Keystone Building, Pittsburgh, Pa. Pamphlet. Deals with crucible and open hearth steel, outlining the grades and tempers in which it is furnished. Among the steels referred to is the Victor high speed steel, adapted for work at excessively high speeds. Price-lists and classification tables for crucible sheet and soft steel, spring steel, safe steel and open hearth machinery steel. A useful table is given for computing weights of cast steel, circular soft plate and sheet steel, and other useful tables are appended.

Rotary Dryers and Conveyors.—The C. O. Bartlett & Snow Company, Cleveland, Ohio. Two bulletins. No. 17 deals with rotary dryers of the direct and indirect type, which have found favor with manufacturers of Portland cement. No. 18 shows many illustrations of conveyors and accessory equipment, including a double strand chain retarding conveyor, a double plunger feeder, a chain car haul and car retarder, coal tipple, elevators, &c., with several pages devoted to parts, such as chain links, crushing rolls, buckets, grading reels, &c.

Boring Mills.—Gisholt Machine Company, Madison, Wis. Loose leaf pages 47 and 48. Pertain to a Gisholt 30-inch mill, described in *The Iron Age*, May 17, 1906.

Small Power Motors.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular No. 1128. Concerns a line of small power motors built for alternating and direct current and illustrates their application to the driving of various light machines.

Rock Crushing Machinery.—Power & Mining Machinery Company, Cudahy, Wis. Catalogue No. 4. Size, 6 x 9 inches; pages, 72. Machinery for rock crushing plants is the subject, and is introduced with a brief history of the development of the McCully gyratory rock crusher. Illustrations showing exterior and sectional views are followed by a complete description of this crusher, covering all of its parts in detail. Other machines described include the Blake & Dodge crushers. The next section deals with elevators, screens, hoists, &c., turntables, overhead travelers, chain blocks and tackles, cars, &c., followed by drawings of complete plants, showing arrangements for service at various plants. Dimension tables of the McCully crusher and testimonial letters are appended.

Punches, Shears and Rolls.—New Doty Mfg. Company, Janesville, Wis. Catalogue E. Size, 8¾ x 8¾ inches; pages, 64. The catalogue has been compiled with a view to facilitate the selection of the machines best fitted for the particular work to be done. At the outset a complete table is given of the capacity of punches and shears, and the remainder of the book is mostly illustrations with brief explanatory text, and here and there a longer description of single and double punches and shears, with belt and motor drive, gang punches, special machines for bridge and architectural work, double end machines, horizontal flange punches, quick action punches, stake riveters, bar and billet shears, angle iron shears, plate bending rolls, belt and hand power bending rolls, gate shears and multiple punches, plate straightening machines, flanging clamps, hand power splitting shears, hand power punches, hand power beveling shears, hand power bending rolls, and various lever punches and shears with belt power, bar iron shears, lever type, &c.

Feed Water Heaters.—Warren, Webster & Co., Camden, N. J. Bulletin known as part I, appendix II, of the general catalogue. Illustrates and deccribes the Webster Star vacuum feed water heater, purifier, filter and receiver, class EC, for capacities ranging from 500 to 5000 horse-power. Initially its advantages are enumerated and there follows a complete account of its construction and operation, in which special reference is made to details that are the basis of the special merits claimed for it.

Gas and Gasoline Engines.—The New Era Gas Engine Company, Dayton, Ohio. Catalogue. Presents a new line of gas and gasoline engines known as the Little Giant. The engine has been sold for the past six years in one size only—5 horse-power horizontal—but to meet the demand for a wider range of sizes a full line, ranging from 1½ to 20 horse-power, has been designed. The company also builds the New Era gas and gasoline engine in sizes from 8 to 125 horse-power.

Pyrometers.—Wm. H. Bristol, 45 Vesey street, New York City. Circular and preliminary bulletins Nos. 2 and 3. The first contains a reprint of a paper read before the American Society of Mechanical Engineers, entitled "A Low Resistance Thermo-Electric Pyrometer and Compensator," by Wm. H. Bristol, an abstract of which was printed in *The Iron Age*, May 17, 1906. The bulletins illustrate and describe the parts and their use.

Large Engines.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1502. Contains an account of the official test of the Allis-Chalmers engines installed in the Subway power house of the New York Rapid Transit Company. An abstract of the result of this test appeared in *The Iron Age*, March 8, 1906.

Outdoor Cranes.—Niles-Bement-Pond Company, 111 Broadway, New York City. Pamphlet. Consists in the main of a number of views of Niles electric cranes, showing installations in stone yards, freight yards, lumber yards and storage yards.

Furnaces.—Rockwell Engineering Company, 26 Cortlandt street, New York. Circular. Deals with the Rockwell pot furnaces for lead and cyanide hardening and for melting soft metals. A number of different styles are shown designed to use gas or oil as fuel.

Pig Iron Production Decreasing.

Our statistics gathered from the coke and anthracite blast furnaces show that the production of pig iron in May was at a less rate than in April. The total output for the 31 days of May was 2,098,746 tons, as against 2,073,222 tons for the 30 days of April. In other words, while coke and anthracite iron was produced at the rate of 69,107 tons a day in April the daily rate in May was 67,701 tons. There were a good many interruptions from bad working last month. It will be seen also from the figures below that the furnace capacity active on June 1 represents even a less rate of production at that time than the average for the month of May, though the number of furnaces active on June 1—296—was the same as on May 1. This is explained by the fact that several furnaces went out of blast in the latter part of the month and the further fact that the average capacity of the furnaces blowing out was greater than that of the furnaces blowing in in May. The weekly capacity of the 296 furnaces active on June 1 was 472,997 tons, as against 484,031 tons on May 1.

In the following table is given the production for May, as compared with the records for the preceding four months:

Monthly Pig Iron Production.—Gross Tons.

	January. (31 days)	February. (28 days)	March. (31 days)	April. (30 days)	May. (31 days)
New York....	119,097	121,484	135,713	127,674	134,048
New Jersey..	16,259	18,280	28,840	33,742	35,973
Lehigh Valley	56,215	55,218	62,724	56,718	53,613
Schuylkill Val.	48,674	47,852	54,826	52,492	48,760
Lower Susquehanna and Lebanon Val.	75,214	57,979	69 225	61,831	57,951
Pittsburgh dis.	511,941	454,611	533,100	498,874	509,777
Shenango Val.	177,467	153,551	178,378	172,342	176,913
West. Penn...	109,695	105,177	106,338	105,190	112,985
Md., Va. and Kentucky ..	83,704	75,251	83,031	75,030	77,069
Wheeling dis..	113,611	114,324	126,343	113,188	104,109
Mahoning Val.	162,075	148,508	169,468	163,019	147,433
Central and North. Ohio..	162,938	154,298	173,494	163,152	168,672
Hocking Valley and Hanging Rock	34,656	32,514	36,675	33,940	36,103
Ill.,Mich.,Minn., Wis., Mo. and Col.....	222,736	197,495	231,815	240,043	255,256
Alabama	141,773	134,792	135,739	137,049	137,790
Tennessee, No. Carolina and Georgia.....	32,838	32,698	39,923	38,938	42,294
Totals....	2,068,893	1,904,032	2,165,632	2,073,222	2,098,746

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of products month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1904.	1905.	1906.	1905.	1906.
January	502.994	1,129,042	1,358,015	21,002	26,305
February	756,260	1,027,937	1,226,760	22,431	26,988
March	913,412	1,232,255	1,400,395	21,280	23 595
April	974.006	1,222,710	1,333,591	20,038	28,054
May	927,534	1,287.438	1,372,423	24,732	29,447
June	788,822	1,149,404	.....	21,761	....
July	694,892	1,114,409	.....	31,220	....
August	747,570	1,186,050	.....	27,461	....
September	936.494	1,262,033	.....	21,645	....
October	971,447	1,370,960	.....	26,799	....
November	962,384	1,334,644	.....	23,776	....
December	1,019,841	1,356,962	.....	29,481	....

Among furnaces blown in in May are one Henry Clay in the Schuylkill Valley, No. 2 Isabella in Allegheny County, one Crozer in Virginia, Martins Ferry in the Wheeling district, one Sheffield in Alabama, and one Dayton in Tennessee. Chattanooga in Tennessee was blown in previous to May 1, but was not reported last month.

Among furnaces blown out in May are Clinton in Allegheny County, one Cambria at Johnstown, Pa., one Bellaire in the Wheeling district, Star in the Hanging Rock district, Anna in the Mahoning Valley, the Southern Steel Company's stack at Gadsden, Ala., Vanderbilt in Alabama, and Embree in Tennessee.

The following table gives the active capacity of furnaces producing coke and anthracite iron on June 1, and the corresponding figures for May 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	June 1. Number in blast.	June 1. Capacity per week.	May 1. Number in blast.	May 1. Capacity per week.
New York:					
Buffalo 13	13	13	25,851	13	28,293
Other New York...19	19	4	4,418	4	4,297
New Jersey..... 8	8	7	7,944	7	7,822
Spiegel 2	2	2	182	1	195
Pennsylvania:					
Lehigh Valley.....27	27	16	11,746	16	11,802
Spiegel 2	2	2	360	2	416
Schuylkill Valley...13	13	12	11,615	11	12,248
Low Susquehanna.. 9	9	5	5,824	4	6,465
Spiegel 1	1	1	599	1	543
Lebanon Valley....11	11	9	6,457	10	7,420
Pittsburgh dist....41	41	39	113,243	39	113,767
Spiegel 3	3	3	2,716	3	2,640
Shenango Valley...20	20	19	39,949	19	40,213
West. Penn.....24	24	18	23,706	19	25,244
Maryland 5	5	4	8,078	4	7,745
Wheeling dist.....14	14	11	23,627	11	22,410
Ohio:					
Mahoning Valley...16	16	14	33,516	15	37,636
Cent. and Northern and Michigan....19	19	19	39,711	19	39,749
Hocking Valley and Hanging Rock...12	12	11	7,906	12	8,096
Illinois 18	18	18	39,504	19	40,405
Spiegel 3	3	3	1,785	2	1,798
Minnesota 1	1	1	1,155	1	1,328
Wisconsin 5	5	5	5,593	5	5,368
Missouri 1	1	1	903	1	895
Colorado 4	4	3	6,265	3	5,901
Spiegel 1	1	1	805	1	827
The South:					
Virginia 23	23	12	8,402	11	8,245
Kentucky 7	7	2	1,232	2	1,164
Alabama 46	46	25	30,107	26	31,978
Tennessee 16	16	15	9,099	14	8,177
Georgia 1	1	1	699	1	944
North Carolina.... 1	1	0	0	0	0
Totals.....377	377	296	472,997	296	484,031

For a series of months the active coke and anthracite capacity fluctuated as follows, in gross tons:

	Capacity per week.		Capacity per week.
June 1.....472,997		March 1.....308,751	
May 1.....484,031		February 1.....273,692	
April 1.....484,240		January 1, 1904.....185,636	
March 1.....479,737		December 1, 1903.....244,156	
February 1.....482,156		November 1.....273,715	
January 1, 1906.....463,673		October 1.....353,142	
December 1, 1905.....475,814		September 1.....360,197	
November 1.....460,449		August 1.....353,681	
October 1.....445,468		July 1.....384,825	
September 1.....412,563		June 1.....388,178	
August 1.....410,088		May 1.....373,496	
July 1.....408 617		April 1.....386,215	
June 1.....443,092		March 1.....347.424	
May 1.....452,031		February 1.....335,339	
April 1.....439,564		January 1, 1903.....346,073	
March 1.....403,157		December 1, 1902.....336,617	
February 1.....405,792		November 1.....330.110	
January 1, 1905.....377,879		October 1.....337,837	
December 1, 1904....357,846		September 1.....328,243	
November 1.....334,249		August 1.....328,745	
October 1.....319,249		July 1.....303,793	
September 1.....291,573		June 1.....337,492	
August 1.....246,092		May 1.....337,627	
July 1.....272,301		April 1.....331,140	
June 1.....336,107		March 1.....316,039	
May 1.....368 244		February 1.....325,440	
April 1.....337,257		January 1, 1902.....291,992	

Wage conference committees of the Amalgamated Association and the Republic Iron & Steel Company have been holding daily sessions in the offices of the latter in Pittsburgh since Monday, June 11, for the purpose of arranging the boiling and finishing scales. Up to Wednesday noon no settlement had been reached, but it is believed there will be no serious trouble.

NEWS OF THE WORKS.

Iron and Steel.

Charles H. Rife, Tusla, I. T., intends to organize a company to build a rolling mill to use scrap. Natural gas will be used for fuel. The present intention is to build a 20-inch muck mill and a 9-inch Belgian finishing mill, the machinery for which Mr. Rife would like to receive bids. He would also be pleased to receive bids on construction of the entire plant.

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, is in receipt of an order for two carloads of Falls hollow staybolt iron bars, to be shipped to the Mitsu Bichi Dockyard & Engine Works, Japan; also for several tons of double refined charcoal iron hollow bars, from its Berlin representative, to be consigned to the Prussian State Railway Department. The company is now shipping its material regularly to Australia, New Zealand, Norway, Prussia, Germany, Japan, China, Corea, Brazil, Peru, Cuba, Porto Rico and other foreign countries.

One Bellaire furnace of the Carnegie Steel Company at Bellaire, Ohio, was blown out May 19.

One Sheffield furnace, Sheffield, Ala., was blown in on May 12 after relining.

Vanderbilt Furnace, at Boyles, Ala., went out of blast June 1 for repairs.

The furnace of the Southern Steel Company at Gadsden went out of blast May 30 for overhauling and relining. It is expected it will be blown in again about August 1. The company is now obtaining basic iron from another furnace at Gadsden, carrying the hot metal to the steel plant, a distance of between three and four miles.

Embree Furnace of the Embree Iron Company, at Embreeville, Tenn., was blown out May 16 for relining.

The Carter Iron Company, Pittsburgh, which recently purchased the plant of the Ohio Valley Steel & Foundry Company at Paden City, W. Va., has leased a large block of gas territory at the latter place and will develop it for gas to operate the steel plant.

The Princess Iron Company has been succeeded by the Princess Furnace Company in the ownership and operation of the furnace and iron ore properties at Glen Wilton, Va. The Princess Iron Company was owned almost entirely by D. S. Cook of Wrightsville, Pa. In the past year Mr. Cook's health was such that he desired to be relieved of the management, and at his request the firm of Matthew Addy & Co., which has had close relations with the Princess Iron Company for a number of years, organized the Princess Furnace Company to acquire the property. William W. Hearne of Philadelphia is president, and J. Esrey Johnson, Jr., formerly assistant general manager of the Longdale Iron Company, Longdale, Va., has been made general manager with entire charge of the operation of the furnace plant and mines. It is the purpose of the present owner to conduct the business on the same lines as those followed by Mr. Cook and to confine itself to the manufacture of foundry iron made from brown hematite ore mined on the property and smelted with New River coke. The furnace and the mine are but one and one-quarter miles apart, and recent investigations have shown that there is enough of the best grade of brown ore in the mine directly back of the furnace to supply its needs for many years. No changes have been made in the operating force at the mines or furnace and none are contemplated.

The Pennsylvania Swedish Iron Company is installing a 6000-pound Chambersburg shingling hammer and heavy scrap shears at its plant at Cheswick, Pa.

The 12-inch mill at the Valley Works of the Republic Iron & Steel Company, Youngstown, Ohio, closed down last week on account of lack of orders. The Bessemer plant at Youngstown will close down this month for repairs and will be idle several weeks.

The Jones & Laughlin Steel Company, Pittsburgh, which now owns a large amount of acreage at Aliquippa on the Pittsburgh & Lake Erie Railroad about 15 miles from Pittsburgh, has optioned an additional 1000 acres, giving it upward of 2000 acres of desirable manufacturing property at this point. What will be done by the company with the property has not as yet been fully determined, but it is not improbable that in the near future it will build blast furnaces, steel plant and finishing mills on part of the land and the balance will be set aside for sites for homes for the employees.

Blast Furnace B of the Riverside department of the National Tube Company at Benwood, W. Va., is out of blast for relining and extensive repairs.

The Weiler Rolling Mill & Forge Company, whose plant at Anniston, Ala., was destroyed by fire some time ago, will start to rebuild at Gadsden within the next few days. For immediate use the company will erect two steel buildings, one 70 x 75 feet and the other 70 x 160 feet. In addition there will be erected one or two small wooden buildings to include a wareroom, blacksmith and machine shops. The capacity of the new mill will be from 60 to 75 tons per day of merchant bar iron and steel T-rails, special shapes and railroad ties. The machinery necessary for equipping this new plant has been arranged for.

General Machinery.

The Kuhner Engine & Machine Company, Rock Island, Ill., has been incorporated with a capital stock of $25,000 to manufacture machinery. The incorporators are Frank G. Young, Harry E. Miller and Morris Heagy. H. E. Kuhner, proprietor of the East Davenport Machine & Novelty Company, manufacturer of gasoline engines and other machinery, is also interested in the company and will remove the plant of the East Davenport company from Davenport, Iowa, to Rock Island and its products will be manufactured by the new company.

John F. Allen, New York, manufacturer of portable pneumatic riveting machinery, pneumatic drilling machines, tool holders, &c., is building an addition of 2000 square feet to his plant and installing new machinery to the value of $8000, which will increase the output about 25 per cent.

W. L. Whitter, Franklin, N. H., is to establish a machine shop on Central street in that place. He will not need new machine equipment for the present.

S. A. Risdon, Waterbury, Conn., manufacturer of machinery, tools and dies, has incorporated his business in Connecticut with a view to enlarging it. The corporation is known as the Risdon Tool Works, Incorporated, and the capital stock is $15,000. Wendell L. Shepard is president and Sidney A. Risdon secretary and treasurer.

Announcement has been made of the incorporation of the Hicks Locomotive & Car Works to succeed the firm of F. M. Hicks & Co., Chicago, Ill. The new company will carry on the business with increased capital and enlarged facilities, with the following officers: F. M. Hicks, president; Elliott C. Smith, vice-president; William McInnes, treasurer; E. Hope Norton, assistant treasurer.

The Indiana Union Traction Company, Anderson, Ind., has under consideration the building of extensive shops this summer. No decision has yet been reached in the matter, but is expected shortly.

The Iowa Machine Works, Clinton, Iowa, has been incorporated with a capital stock of $15,000. The company has opened a machine and repair shop and foundry and will do a general machine business, making a specialty, however, of steamboat machinery. The officers are E. S. Reynolds, president, and J. F. McGinty, secretary and treasurer. The latter was for many years connected with the Clinton Novelty Iron Works, and Mr. Reynolds was also in the employ of the same company. W. J. Keefe is also a director in the new company, though not actively concerned in the business.

The V & O Press Company, Glendale, Long Island, N. Y., has recently installed modern machinery, doubling the former capacity and greatly increasing its facilities. The addition was made necessary owing to the increasing demand for the V & O products. The company manufactures high grade presses, dies and special machinery.

The Buckeye Forging & Specialty Company, Sebring, Ohio, reports that it is working up to the full capacity of its plant on orders for railroad forgings. It is contemplating an addition to its factory.

The United States Circuit Court of Appeals, sitting in Philadelphia, has handed down a unanimous decision in the case of the Westinghouse Electric & Mfg. Company against the Cutter Electric & Mfg. Company, that the Westinghouse patent is valid and the Cutter circuit breakers are an infringement thereof.

Henry Pels & Co., 68 Broad street, New York, whose specialty is the manufacturing of punches and shears for the structural and boiler trade, have sent a large stock of machinery to San Francisco, where it is kept in stock for prompt delivery. The stock comprises hand power beam punches and beam shears, also miscellaneous punches and shears of different capacities. The demands of the Pacific Coast trade will be supplied from the San Francisco stock.

Power Plant Equipment.

The Chippewa Valley Electric Railroad Company, Eau Claire, Wis., has let the contract to the Power Engineering Company, Minneapolis, for a pair of horizontal turbines, and will install with these wheels a direct connected 500-kw. generator. The company has under consideration the development of an outside water power which will require an expenditure of $200,000.

The Pabst Brewing Company, Milwaukee, Wis., is making extensive improvements to its boiler house and electric power plant, involving an expenditure of between $450,000 and $500,000. Contracts for the equipment have been placed as follows: Platt Iron Works, Dayton, Ohio, six 400 horse-power Munoz boilers; Murphy Iron Works, Detroit, stokers; Green Fuel Economizer Company, Matteawan, N. Y., economizers; Link Belt Machinery Company, Chicago, coal and ash handling machinery; Morava Steel Company, Chicago, structural iron work for the building. The chimney, which will be 225 feet high, with an 11-foot flue, will be built by the Heine Chimney Company, Chicago. Strachota & Sons, Milwaukee, have the general contract for the building. The new electrical equipment will consist of two 400-kw. alternating current generators driven by compound non-condensing engines; one 300-kw. alternating current generator driven by a simple engine; one 100-kw. direct current generator driven by a simple engine and two 100-kw. motors driven by ex-

citer sets. The Allis-Chalmers Company, Milwaukee, will furnish the above electrical machinery. The switchboard will be supplied by Johler Brothers, Chicago. The motors, about 130 in number, will be furnished by the Westinghouse Electric & Mfg. Company, Pittsburgh.

The Père Marquette Power Company will build a power plant of about 3000 horse-power on the Père Marquette River, about 25 miles from Pentwater, Mich. A dam 400 feet long and 33 feet high will be constructed. J. N. Cotton, Hart, Mich., is president of the company.

The Winona Wagon Company, Winona, Minn., has purchased for installation in its plant three 180 horse-power internally fired boilers and a 100-foot smokestack from the La Crosse Boiler Works, La Crosse, Wis. The wagon company has recently equipped its entire factory with automatic sprinklers supplied by the Niagara Fire Extinguisher Company.

The Board of Public Works of Cleveland, Ohio, has canceled the contract recently made with the Allis-Chalmers Company of Milwaukee for a 500-kw. steam turbine and generator and has given the contract to the Westinghouse Machine Company, Pittsburgh, owing to the inability of the first-mentioned company to make deliveries in the time set forth in the contract. The engine is for the municipal lighting plant, and contracts will shortly be closed for boilers and other equipment.

The Bruce-Merriam-Abbott Company, Cleveland, Ohio, which until recently has been building small gas engines, is now building engines up to 150 horse-power, and expects soon to be in position to build gas engines up to 250 horse-power. It has recently sold three 100 horse-power engines to the Thomas Motor Car Company at Buffalo and three 100 horse-power machines to a company at Boston. It is now crowded to the full capacity of the factory and is considering the advisability of putting up a new plant.

The Standard Oil Company has ordered two Hornsby-Akroyd oil engines of 25 horse-power each, which will be shipped to Chinkiang, China, and used for pumping purposes. These engines are supplied by the De La Vergne Machine Company, New York. The use of oil engines has increased largely in the past few years, there being now over 14,000 oil engines of the Hornsby-Akroyd make alone in operation.

The Allis-Chalmers Company, Milwaukee, Wis., has taken an order from the Carnegie Steel Company for four gas driven blowing engine units, each consisting of a horizontal twin tandem double acting gas engine of 3000 horse-power, having two direct blowing tubes with a capacity to deliver 30,000 cubic feet of free air per minute against a pressure of 18 pounds per square inch. These engines will be installed in the Homestead works. The Carnegie Company has also placed an order with the Milwaukee company for an electrical generating unit, consisting of a horizontal twin tandem gas engine direct connected to a 2000-kw. generator. The Allis-Chalmers Company has also taken an order from the Cincinnati, Milford & Loveland Traction Company, Cincinnati, for a complete equipment of power and electrical machinery, including two 16-inch and 34-inch by 42-inch engines, two 500-kw. generators, two 22½-kw. exciters and two 400-kw. rotary converters. Other orders received are the following: Tanana Electric Company, Fairbanks, Alaska, one 10, one 15 and two 20 horse-power induction motors; City of Casey, Ill., one 115 and one 25-kw. generator and one 9-kw. exciter; Crown Cork & Seal Company, Baltimore, Md., one 200-kw. generator; Chandler & Taylor Company, for Wuest & Bauman Hunt Company, Cleveland, Ohio, one 75-kw. generator; El Palmarito Mining Company, Philadelphia, one 14 x 24 inch engine; Stearns & Culver Lumber Company, Bagdad, Fla., a 24 x 36 inch engine; International Paper Company, New York, four 22 x 42 inch engines; Republic Iron & Steel Company, Thomas, Ala., four 44 x 84 inch and 84 x 60 inch blowing engines; Waterbury Rolling Mills, Incorporated, Waterbury, Conn., one 22 x 48 inch engine; Rockdale Improvement Company, Rockdale, Texas, one 14 x 30 inch engine; Winona Copper Company, Houghton, Mich., one 16 and 30 inch by 36 inch engine, one 250-kw. generator and one 15-kw. exciter.

The Crocker-Wheeler Company, Ampere, N. J., has received an order from the American Wood Working Company, Rochester, N. Y., for one 200-kw. 250-volt direct current generator; American Fork & Hoe Company, Ashtabula, Ohio, two 75-kw. 240-volt generators; Garford Company, Elyria, Ohio, three 130-kw. 250-volt gas engine driven generators.

Locke Brothers, Muncie, Ind., are looking for a site at Lexington, Ky., with the intention of establishing new boiler works at a cost of $50,000. It is probable that the shops will be built this year.

The Ramsey Engine Company, Bullitt Building, Philadelphia, Pa., has been formed to exploit the Ramsey crank mechanism, a device applicable to all single acting engines. A number of advantages are claimed for this device, and it is stated that in a series of tests made under the supervision of the University of Pennsylvania on a vertical engine having a 9-inch cylinder and 7-inch crank a total efficiency of 25.9 per cent. was obtained. It is not the intention of the new company to manufacture engines, but to license rights to engine builders. Robert H. Ramsey, the inventor of the mechanism, is president; Russell H. Ramsey, vice-president and general manager; R. Howard Eisenbray, secretary and treasurer. Russell H. Ramsey and Mr. Eisenbray were formerly connected with the Harrison Safety Boiler Works of Philadelphia.

The Norfolk Railway & Light Company, Norfolk, Va., has placed orders for the equipment of its new power house, which will be of 10,500-kw. capacity, composed of three 3000 and one 1500 kw. Curtiss turbines and 14 650 horse-power Babcock & Wilcox boilers, each equipped with Roney stokers. The turbines will be of the condenser type and will be fitted out with the Alberger condensers. All fuel will be handled mechanically and can be delivered by rail or water. There will be three substations installed at the present time, one at Ocean View, one at the power house site at Norfolk, and one to replace the several small generator plants in Portsmouth. Later on a substation will be installed at or near Suffolk.

The Shaw-Brown Motor Company, Buffalo, N. Y., capitalized at $15,000, has filed articles of incorporation and will begin business at once. The directors are William Hoddick, Charles E. Shaw and Garnet G. Brown.

The Buffalo Gasoline Motor Company, Buffalo, N. Y., is building a three-story addition to its plant on Niagara street, and is adding one story to its present factory building, making it three stories. Considerable new equipment will be installed in the added machine shop space, which will be provided for in the new additions.

A company has recently been organized known as the Delmarvia Construction Company, for building an entire new power plant and distribution system for serving residents of Wilmington, Del. This undertaking, it is understood, is being financed by Baltimore interests. A new plant is now under construction and is designed entirely for steam turbines. Two 500-kw. Westinghouse-Parsons units will be installed at the present time, with engine and motor driven exciter units. The plant will furnish power to an alternating current distribution system at a frequency of 60 cycles.

Foundries.

The R. J. Schwab & Sons Company, Milwaukee, Wis., manufacturer of the Gilt Edge house heating furnace, has commenced work on the erection of a new foundry and machine shop in connection with its plant on Reed street. The new plant is being erected on the site of the old shops of the company, which have been torn down. The structure is to have a frontage of 189 feet on Reed street and will be 42 feet deep. Concrete blocks and reinforced concrete pillars will be used in the construction of the building, which will contain all appliances and machinery of a modern machine shop and foundry. An important line of manufacture of the Schwab Company, in addition to its furnace business, is that of concrete block machines.

The Penn Steel Casting Company, Chester, Pa., is to enlarge its plant by the erection of an addition, 80 x 200 feet, the new building to be built especially for making small castings, in order to relieve the large foundry. The new building will be constructed on pilings and will have all modern improvements.

The Dunstan Mfg. Company, Lorain, Ohio, has been formed with $30,000 capital stock, by Geo. Dunstan, Geo. F. Hess, J. J. McGuire, A. R. Maddock, Custer Snyder and others of Lorain. The company has purchased the building of the City Foundry Company, which will be used temporarily for the manufacture of a patent sewer trap invented by Geo. Dunstan. It is the intention to erect a new foundry in the near future.

The Catasauqua Casting Company, Catasauqua, Pa., has been incorporated with a capital stock of $50,000 to take over the plant formerly operated by the Union Foundry & Machine Company. The plant is well equipped and no new machinery will be added at the present time. A. W. Findlay is general manager.

The Day Foundry Company has been incorporated at Buffalo, N. Y., with a capital stock of $20,000. The directors are Reginald F. Day, William Smith and P. B. McNaughton.

Bridges and Buildings.

The Pueblo Bridge Company, Pueblo, Col., has been awarded a contract for 15 iron bridges by the Canon City & Royal Gorge Interurban Railway Company, to be built along its 11-mile run extending to the top of the Royal gorge. A bridge spanning the gorge 2800 feet above the river will not be built until later.

Since the disastrous fire in San Francisco the Wayte Iron Works has been incorporated by Walter J. Wayte, who is president, and San Francisco and Los Angeles capitalists. The company has placed an order with the Scully Steel & Iron Company, Chicago, for $18,000 worth of structural and plate working machinery to equip its new structural iron plant, which will shortly be erected in San Francisco. The shop will be 120 x 300 feet and arranged so that it can be extended at any time. When erected it will cost approximately $20,000 and will be constructed of steel, with corrugated roofing and sides. This order of machinery, which is only a portion of that which will eventually be bought, will be shipped within the next 60 days. Mr. Wayte is at present the consulting engineer for the American beet sugar interests on the Coast and in Colorado.

Fires.

The plant of the Consumers' Ice & Coal Company, Hopkinsville, Ky., was destroyed by fire June 7.

The plant of the Latrobe Foundry & Machine Company, Latrobe, Pa., was destroyed by fire June 12. It will probably be rebuilt on a larger scale.

The factory of the Stuyvesant Piano Company, 148th street, New York, was destroyed by fire June 12 with a loss of $100,000.

Hardware.

The H. C. Hart Mfg. Company, Unionville, Conn., has been organized with a capital stock of $25,000, to manufacture cutlery and hardware. The business was established as a copartnership by Ernest M. Hart and Willis O. Hart. Their father, H. C. Hart, for whom the company is named, will be the president of the comporation, but will take no active part in the management. E. M. Hart, the treasurer and manager of the new company, was for 16 years the superintendent of the Upson & Hart Company. W. O. Hart will be the secretary of the corporation. The plant of the Dunham Nut Company has been leased for the new business and machinery is now being installed.

The Parish & Bingham Company, Cleveland, Ohio, manufacturer of stampings and sheet metal goods, is erecting a two-story building, 47 x 218 feet, of brick and steel, and will install additional presses and other machinery.

The Champion Rivet Company, Cleveland, Ohio, is erecting a new manufacturing plant on the Erie Railroad, east of the city, where a 23 acre site has been secured. The plant will consist of a main building, 350 x 700 feet, and one story high. There will also be a forge shop 100 x 300 feet, and 40 feet high, built of structural steel and concrete. There will be an independent power plant for operating all machinery by motors, and boilers, engine and generator giving about 700 horse-power capacity will be installed. Geo. S. Rider & Co., Cleveland, are the engineers for the power plant. A large amount of machine shop equipment will be installed, some of it already purchased. Considerable forging machinery will be installed and contracts have been placed with the Acme Machinery Company, Cleveland, for a number of forging machines. The new plant is to be in operation by the first of the year and will give the company more than double its present capacity.

Miscellaneous.

The Sterling Brass Works, Chicago, has been incorporated with a capital stock of $20,000, to manufacture and deal in brass goods. The incorporators are: Charles P. Burbach, 271 Seminary avenue; John S. Hunter, and Fred. Van Voorst.

The American Can Company has awarded contract for the construction of its new three-story building, 80 x 226 feet, at New Orleans, La.

The Roanoke Rapids Paper Mfg. Company, Richmond, Va., organized with a capital stock of $150,000, will erect a large paper plant at Roanoke Rapids, N. C. Bids for the machinery have been received and orders for the greater part of it have been placed. Contract for the building will be let within the next two weeks.

The Guiland Valve Company, Pittsburgh, has been granted a charter with a capital of $6000. The company proposes to build a plant in the Pittsburgh district for the manufacture of gas, steam and water valves.

The Lafayette Electrical Mfg. Company, Lafayette, Ind., has increased its capital stock from $35,000 to $70,000. Thomas Duncan is president.

The Hewitt Rubber Company, Buffalo, N. Y., has commenced the erection of an addition to its plant, 60 x 200 feet, of fireproof construction, being a duplicate of the rubber mill building erected last year. Considerable new rubber mill and hose making machinery will be installed.

The Duquesne Motor Car Company is moving its plant from Jamestown, N. Y., to Erie, Pa., where the company will be reorganized on a larger scale, with a capital of $300,000.

The Barcalo Mfg. Company, Buffalo, N. Y., manufacturer of iron and brass bedsteads, &c., is building a three-story addition to its factory.

Dr. O. H. Mennet of Columbus, Ind., has been appointed receiver of the Janney Mfg. Company of that city. The company was organized in October, 1905, by G. Campbell Janney of Ottumwa, Iowa, the people of Columbus subscribing for $100,000 of stock. A plant costing $50,000 was erected. The Janney Company, which had had a large plant at Ottumwa, Iowa, met with many difficulties in closing up its affairs there and moving to the Indiana city. The buildings and real estate were finally sold to George B. and Frank W. Simmons, to be occupied by the American Mining Tool Company, controlled by them, and by the Royal Stove & Range Company of Greenville, Ohio. Delay in getting the machinery installed in the new location caused dissatisfaction and complications among the stockholders there. A voting trust was formed and the common stock was put in charge of the trustees. It is believed the receiver will be able to wipe out the debts and start up the plant. The company has $300,000 capital stock. G. Campbell Janney resigned as president and Francis T. Crump was elected to succeed him.

It has been announced at New Castle, Pa., that the Standard Motor Truck Company, which is controlled by the Standard Steel Car Company, Butler and Pittsburgh, will have its plant in New Castle in operation within 60 days. Two hundred men are to be employed at the start, and this number is to be increased as fast as possible until 600 are employed. The company will build electric cars, and occupies the tube mill property, which it recently purchased.

The United Wire & Supply Company, Providence, R. I., manufacturer of jewelers' supplies, is having plans prepared for a new factory building. The dimensions are not fully determined, but the building will probably be about 70 x 100 feet, and three stories.

The American Optical Company, Southbridge, Mass., is to erect a new building as an addition to the main factory and adjoining present workrooms. The structure will be 40 x 160 feet, four stories and basement. It will be used in connection with the company's gold and gold filled departments.

The New Departure Mfg. Company, Bristol, Conn., maker of balls, bicycle holders and plumbers' supplies, has decided to enlarge its German branch at Berlin. Plans for more than doubling the capacity of the Berlin works have been prepared and the additions will be built this season. President A. F. Rockwell of the company will soon sail for Europe, and will pass considerable time at Berlin in connection with the plans for the extensions of the plant. The company states that no new machinery will be required.

The Windsor Locks Electric Company, and the Enfield Gas Company have been consolidated and it is proposed to change their name to the Northern Connecticut Light & Power Company. The new company will furnish gas and electricity for Windsor, Windsor Locks, Thompsonville, Warehouse Point and Enfield, Conn. A new power house will be built at Windsor Locks, to be 50 x 150 feet. The company is not in position to state what new power equipment will be required.

Neal Brothers, Pittsburgh, have sold their limestone quarries near New Martinsburg, W. Va., to the Berkley Limestone Company for the reported price of $140,000. The purchasers will spend a large amount of money in making improvements and enlargements at these quarries.

The Fulton Contracting Company has been incorporated at Buffalo, N. Y., with a capital stock of $50,000, to do general construction business. The directors are: L. A. De Graff, New York; Charles Mosure and William Summers, Buffalo. The new company has secured a contract for building a section of the new Erie Barge Canal.

The American Shipbuilding Company, Cleveland, Ohio, has booked seven orders for large freight steamers for 1907 delivery, two contracts being closed last week. These are for steamers 545 feet over all, 55 feet beam and 31 feet deep. They will have a capacity of 10,000 tons each. One of the vessels is for Henry Steinbrenner and the other for Charles Hutchinson, both of Cleveland.

The Ajax Forge Company, Chicago, has doubled its capital stock, making it $500,000.

The Elyria Iron & Steel Company, Elyria, Ohio, will erect a new building for a storage house and will install machinery which will about double the capacity of the present plant.

Corrosion of Steel vs. Iron.

The National Tube Company, Pittsburgh, Pa., has recently developed Spellerized Steel for the manufacture of tubular goods. It is now using this material in the manufacture of boiler tubes. Henry M. Howe, professor of metallurgy Columbia University, New York, has just completed one set of tests of this steel against charcoal iron and common iron. His report follows:

Material.	Plate No.	Loss of weight. Grams per square inch of surface.	Maximum loss. Minimum loss.	Aver. loss. Grams per sq. in.	Per cent. excess av. corrosion W. I. over av. corrosion steel.
Steel...	C 4	0.0692			
	C C 0	0.0611			
	C C C 5	0.0538	Max. 0.0692		
	C 1	0.0510		0.0576	
	C 2	0.0633	Min. 0.0484		
	16	0.0492			
	y 17	0.0645			
	x 18	0.0484			
					14.6
Charcoal iron.	C D 13	0.0745		Av. loss charcoal iron. 0.0666	
	C D 14	0.0625			
	C D 15	0.0629			
	D 11	0.0577	Max. 0.0864	Av. loss muck bar 0.0657	
	D 12	0.0864			
Muck bar	D D 6	0.0563	Min. 0.0559		0.0660
	D 9	0.0641			
	D D D 7	0.0692			
	D D D 8	0.0559			
	D D 10	0.0701			

This steel seems to corrode evenly and not to be subject to pitting, making it especially desirable for locomotive and stationary boilers where bad water is used.

The Iron and Metal Trades

May, being a month of 31 days, showed a production of 2,098,746 tons of Coke and Anthracite Pig Iron, as compared with 2,073,222 tons in April, a month of 30 days, which proves that the stacks have not been doing as well lately, with the approach of summer. With the same number of furnaces blowing the capacity at work declined from 484,031 tons per week on May 1 to 472,997 tons on June 1. The production of the plants owned by the Steel companies was 1,372,423 tons in May, as compared with 1,333,591 tons in April.

So far as stocks are concerned, it may be stated, with the reserve which the absence of official statistics from the East and the Central West imposes, that accumulations are very light. It is known that the Steel Corporation has been running along for months with a stock, including all kinds of Iron, which has fluctuated between 130,000 and 140,000 tons. The whole South had a trifle over 100,000 tons on June 1. Consumption therefore is keeping wonderfully close to an enormous production. Buying from the merchant furnaces outside of Steel Making Irons and of Pipe Irons has now been light for months, and a sharp buying movement may set in as soon as the crop situation is clear. It is not believed that melters will anticipate crop results.

Some wild reports of large sales of Bessemer Pig for forward delivery have come from Pittsburgh, which prove to be incorrect so far at least as the United States Steel Corporation is concerned. That interest has not purchased more than trifling quantities for the third quarter. What has been done is that the Republic Company has bought 17,500 tons additional for the third quarter, and the Sharon Steel Hoop Company 5000 tons from the Bessemer Association, which by the way does not now include as many furnaces as it did six months since. The report that the Cambria Company has taken 90,000 tons for the second half cannot be verified. In Chicago the Illinois Steel Company has bought 5000 tons of Bessemer from a merchant furnace in the district, which takes that plant out of the general market to that extent. In the East only small lots of Steel Making Irons have changed hands. Generally speaking, the situation is strong in this branch of the industry.

Only a moderate business for forward delivery is being done in Foundry Irons. Pipe makers have been buyers to a moderate extent, but the general foundry trade is holding back for the third quarter, and it looks like a test of strength, particularly with the Southern furnaces, who, however, have this in their favor, that they are accumulating very little Iron. Practically complete returns from the Southern plants, including Virginia, Alabama and Tennessee, show an increase of only 4665 tons for May.

Rail makers have up for consideration an inquiry for 23,000 tons from the St. Louis & San Francisco line and two lots of Rails, aggregating between 9000 and 10,000 tons, from Mexico. During the week the leading interest has sold a lot of about 18,000 tons for export for delivery during this year.

The markets for Structural Material are rather quiet. It is expected that during the current week the material for four additional boats to be built on the lakes will be placed. The quantity involved is about 20,000 tons. Orders aggregating 7000 tons have been placed by bedstead makers for Hard Angles. In the Chicago district the Structural material for the new Gary Rail mill, amounting to about 10,000 tons, will be taken into the shop soon.

In the lighter lines the mills continue exceedingly busy. The demand for Sheets, Tubes and Wire products continues good. One order for 25 to 35 miles of 16-inch Pipe was placed this week.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	June 13, 1906.	June 6, 1906.	May 16, 1906.	June 14, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.50	$18.50	$18.50	$16.75
Foundry No. 2 Southern, Cincinnati	16.75	16.75	16.75	14.75
Foundry No. 2, Local, Chicago	*18.25*	18.50	18.50	16.50
Bessemer, Pittsburgh	18.10	18.10	18.10	15.85
Gray Forge, Pittsburgh	*16.35*	16.35	16.50	15.35
Lake Superior Charcoal, Chicago	19.00	19.00	19.00	17.00
BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**26.50**	26.00	26.00	22.00
Forging Billets, Pittsburgh	32.00	32.00	32.00	25.00
Open Hearth Billets, Phila	29.00	29.00	29.00	26.50
Wire Rods, Pittsburgh	*34.00*	34.00	34.50	33.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	14.00	14.00	14.00	12.00
O. Steel Rails, Philadelphia	*16.25*	16.25	16.50	15.00
O. Iron Rails, Chicago	21.25	21.25	21.25	16.50
O. Iron Rails, Philadelphia	*20.50*	21.00	21.00	18.50
O. Car Wheels, Chicago	*18.00*	18.00	19.00	14.25
O. Car Wheels, Philadelphia	16.75	16.50	16.75	15.00
Heavy Steel Scrap, Pittsburgh	**15.75**	15.75	15.00	13.75
Heavy Steel Scrap, Chicago	*13.00*	13.50	13.50	11.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.63½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.50
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.60
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	**2.40**	2.40	2.25	2.20
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	*1.75*	1.75	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	18.75	18.75	18.75	15.00
Spelter, St. Louis	**6.00**	5.90	5.85	5.10
Lead, New York	6.00	6.00	6.00	4.50
Lead, St. Louis	**5.92½**	5.90	5.87½	4.42½
Tin, New York	*38.87½*	39.65	49.00	30.25
Antimony, Hallett, New York	*25.00*	26.00	26.50	11.50
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	**$3.94**	$3.94	$3.79	$3.74

Chicago.

FISHER BUILDING, June 13, 1906.—(*By Telegraph.*)

That Steel consumption is still at a record pace is indicated by the continued operation of Steel works at their capacity, and the purchases of Bessemer Iron by Steel Corporation companies and large independent interests reflects the pressure on furnaces to provide Steel making requirements. The Illinois Steel Company, unable to secure further shipments from the Mahoning and Shenango valleys, has purchased from a local interest 5000 tons of Bessemer, which is to be made at a Wisconsin merchant stack that has been operating on Foundry Iron. This change to Bessemer is also indicative of the weakness in Northern Foundry grades, which have declined to meet the competition of Ohio producers. To insure its own Pig Iron supply the Inland Steel Company has decided to erect two blast furnaces at Indiana Harbor, and the Pig Iron production of the Illinois Steel Company will be increased 450 tons daily by the blowing in of a new furnace at South Chicago. The renewed interest in 1907 Rail requirements displayed by Western roads is shown by the negotiations under way by the Missouri, Kansas & Texas Railroad and the St. Louis & San Francisco branch of the Rock Island system for the purchase of 21,500 and 23,000 tons, respectively, from Eastern mills. The Structural tonnage booked by the American Bridge Company during the week in the West approximates only 1000 tons, although the specifications for the Rail mill building to be erected at Gary, for which 10,000 tons will be required, will come forward shortly. Structural mills, nevertheless, continue well up on deliveries and shipments of practically all sections can be made in three weeks. Activity in lake shipyards is assured, as the American Shipbuilding Company has secured contracts up to the present

for ten boats—nine freighters and one passenger. The Steel for four of these carriers will probably be placed this week, aggregating a total of 20,000 tons. Cast Iron Pipe has been advanced $1, as all the foundries are well filled through the summer months and shipments in small lots cannot be made in less than 60 days.

Pig Iron.—Western foundries, with few exceptions, while carrying exceedingly small stocks, are limiting purchases to small lots for concurrent needs, in preference to covering for the future on the present basis. The number of small orders placed during the week was larger than at any time in the past two months, showing that the melt is heavy, notwithstanding the molders' strike. Some Southern grades are now offered on the basis of $13.50, Birmingham, for No. 2, and the International Harvester Company is reported to have purchased 2000 tons at this price. The largest Southern producers are, however, strictly adhering to $14 and will make no concessions. The Sloss-Sheffield Steel & Iron Company has practically disposed of its stock of 20,000 tons of Gray Forge, which has been sold at $12, Birmingham, and quotations on this grade have been advanced 50 cents a ton. Mottled Iron is still held at $11.75, 75 cents below the forge basis. Malleable foundries with large contracts on their books for the last half are still holding off and are not interested in the price of $18.30, which is freely offered. Ohio furnaces are competing keenly for local tonnage and are quoting $16, furnace, for No. 2 and as low as $15.75 has been done. This has resulted in a decline of local grades to $18.25. The refusal of furnaces to sell for a period of five years has resulted in the practical withdrawal of the inquiry of the Beaver Dam Malleable Iron Company, Beaver Dam, Wis., for 15,000 tons annually, and the Iron will be purchased as required. One of the two stacks at the North works of the Illinois Steel Company has been blown out, but new furnace E, just completed at the South works, is to be blown in on Friday. Prevailing quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal	$19.00 to $19.50
Northern Coke Foundry, No. 1	18.75 to 19.00
Northern Coke Foundry, No. 2	18.25 to 18.50
Northern Coke Foundry, No. 3	17.75 to 18.00
Northern Scotch, No. 1	19.25 to 19.50
Ohio Strong Softeners, No. 1	18.55 to 18.80
Ohio Strong Softeners, No. 2	18.05 to 18.30
Southern Coke, No. 1	17.90 to 18.40
Southern Coke, No. 2	17.40 to 17.90
Southern Coke, No. 3	16.90 to 17.40
Southern Coke, No. 4	16.40 to 16.90
Southern Coke, No. 1 Soft	17.90 to 18.40
Southern Coke, No. 2 Soft	17.40 to 17.90
Southern Gray Forge	16.40
Southern Mottled	15.65
Malleable Bessemer	18.30
Standard Bessemer	19.55 to 19.80
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	23.30 to 23.80

(*By Mail.*)

Billets and Rods.—Owing to the scarcity of Steel to provide for its own requirements the Illinois Steel Company continues out of the market on forging Billets and Eastern mills are offering carload lots on the basis of $33.50 to $34, f.o.b. Chicago, net ton. The demand for Bessemer and Open Hearth Rods is strong and the American Steel & Wire Company is still unable to make shipments as promptly as desired by consumers. We quote Bessemer and Open Hearth Rods on the basis of $35 to $36, Chicago.

Rails and Track Supplies.—The Pennsylvania Steel Company has been awarded the contract for 500 tons of Girder Rails for this year's delivery. A round tonnage of Standard Sections for 1907 is under negotiation, but as yet remains unclosed. There is a considerable scarcity of Spikes for prompt delivery and 2.35c. is readily obtainable. The Tennessee Coal, Iron & Railroad Company is now rolling an order of 20,000 tons of Open Hearth Rails for the Great Northern Railway and numerous orders have recently been received for small lots to be tried in hard service by Western roads. Quotations are unchanged, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $27 to $28; 25-lb., $29; 20-lb., $29 to $30; 16-lb., $30 to $31; 12-lb., $31 to $32, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections are unchanged, at $28, f.o.b. mill, full freight to destination.

Structural Material.—Having deliveries ahead for only about three weeks' rolling, the structural mill of the Illinois Steel Company is now in good condition to make early deliveries on all kinds of Shapes. This mill has been producing at the rate of 15,000 tons a month and a large portion of the tonnage transferred from the Carnegie Steel Company has already been rolled, although some deliveries are spread through the summer and fall months. Hard Angle tonnage placed during the week by bedstead makers is estimated at close to 7000 tons, at prices ranging from 1.45c. to 1.50c., Chicago. The mills rolling these Shapes from Old Rails have been unable to compete on this basis, having fixed their price for last half tonnage at 1.65c. The American Bridge Company was awarded contracts for about 1100 tons, as follows: Arcade Building, Seattle, 300 tons; Franklin Building, 200 tons; Prætorian Building, Dallas, Texas, 350 tons; Sixty-eighth Street Pumping Station and the South Park Power Station, 100 and 150 tons, respectively. We make the following quotations: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—The outlook has improved somewhat during the past few days, specifications coming forward more freely from boiler makers and shipbuilding interests. The American Shipbuilding Company has already booked orders for nine freighters for 1907 delivery. The Steel contracts for five of these have already been placed and the remaining four are under negotiation. The total quantity of Plates and Shapes required for these boats is estimated at 35,000 tons. The reports of shading on Universal Mill Plates are not confirmed in this market, but in a few instances slight premiums have been paid to secure prompt deliveries. Official quotations are unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—There is no abatement in the heavy demand for both Black and Galvanized Sheets and deliveries on assorted sizes cannot be made by the American Sheet & Tin Plate Company in less than 60 days. Up to June 1 the shipments from its mills of all kinds of products, including both Sheets and Tin Plates, are 50,000 tons in excess of those during the same period last year. On this basis it may be assumed that this year's production and shipments will easily exceed 1,100,000 tons. The independents are practically in the same position as to production and future prospects, and as they are experiencing little difficulty in securing Steel their production this year will establish new high records. Quotations on mill shipments, Chicago, are as follows: Blue Annealed, Nos. 9 and 10, 1.96½c. to 2.01½c.; Nos. 16 and 17, 2.16½c. to 2.21½c.; Box Annealed, Nos. 18 to 20, 2.36½c. to 2.41½c.; No. 27, 2.56½c. to 2.61½c.; No. 28, 2.66½c. to 2.71½c.; Galvanized Sheets, Nos. 10 to 14, 2.71½c.; Nos. 17 to 21, 2.96½c.; Nos. 22 to 24, 3.11½c.; Nos. 25 and 26, 3.31½c.; No. 27, 3.51½c.; No. 28, 3.71½c.; No. 30, 4.21½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—New tonnage in Steel Bars continues light and the refusal of large buyers to contract for future requirements has given rise to a rumor of a concession of $1 a ton by one large interest, which has, however, been emphatically denied. Concessions on Iron Bars reported in the East are said to have been withdrawn, and notwithstanding the curtailed tonnage now going to the mills quotations are being firmly maintained on the basis of $1.66½c. We quote as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Band, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—Shipments of Galvanized Pipe, owing to the heavy demand, are deferred from three to four weeks and on certain sizes of Black Pipe the mills are unable to make deliveries as promptly as desired by the large distributers. Quotations remain unchanged on the basis of 81 per cent. off the list, Pittsburgh, but official discounts on car lots, Chicago, are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Mills are now receiving specifications very freely on the large contracts placed at concessions some time ago. Owing to the competition of the outside mills these prices have not yet been withdrawn. Discounts on base sizes, 2¾ to 5 inches, in car lots, are as follows: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—As a result of the heavy demand and the inability of the foundries to make shipments within less than 60 days prices on all sizes have been advanced $1 a ton. The city of Chicago placed an order with the United States Cast Iron Pipe & Foundry Company for 2000 tons during the week and Western railroads purchased scattering lots aggregating approximately the same tonnage. We revise quotations, as follows: Water Pipe, 4-inch, $32; 6, 8, 10 and 12 inch, $31; over 12-inch, $30, with $1 extra for Gas Pipe. Large municipal contracts are now being placed on the above basis and no exception is made by the foundries on the sizes of the purchases.

Merchant Steel.—Notwithstanding the season the mills are receiving fairly heavy specifications from implement makers for all kinds of shapes and scattering contracts still continue to be received for the ensuing year's requirements. The Shafting market has strengthened considerably and some of the makers are in favor of making a slight advance. Prices are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ inch, 1.81½c.; Iron Finish, 1½ x ½ inch and larger, 1.66½c., base; Channels for solid rubber tires, ¾ to 1 inch, 2.16½c., and 1⅛-inch and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—The continued heavy consumption of Furnace Coke is the only factor that tends to maintain the present basis on the foundry product, as many of the ovens are operating on furnace fuel that had previously been competing for the foundry trade. Consignments, however, continue to be freely made from both Connellsville and Virginia fields, the former being sold on a basis of $5.40 to $5.65, Chicago, and the latter at $4.75 to $5. By-product Coke is quoted at $5.40 to $5.65 on contracts, and as high as $5.80 is secured in car lots for prompt delivery.

Old Materials.—Both the Inland Steel Company and the Grand Crossing Tack Company have purchased large tonnages of Heavy Melting Scrap on the present low basis, for delivery during the next three months. It is estimated that the purchases of these companies will aggregate considerably more than 10,000 tons. Iron mills that have been purchasing Scrap freely are practically out of the market for the present and do not contemplate placing additional contracts until a lower basis is reached. The Chicago, Milwaukee & St. Paul Railroad this week disposed of 2500 tons of material, the bulk of which was taken by the dealers. Sales of relaying Rails include 1000-ton lots to the Texas Railway Company, San Antonio, Texas, and the Southeastern Railway Company, at prices ranging from $27 to $27.50. Slightly lower values have been recorded on Mixed Bushelings and Borings, and Steel Scrap is now down to a basis of $13 to $13.50, according to the nature of the material. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 feet and over	16.00 to 16.50
Old Steel Rails, less than 4 feet	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 pounds and under	27.00 to 27.50
Old Car Wheels	18.00 to 18.50
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.00 to 13.50
Mixed Steel	11.00 to 11.50

The following quotations are pet net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	23.00 to 23.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	11.00 to 11.50
Mixed Busheling	9.75 to 10.25
Iron Axle Turnings	9.75 to 10.25
Soft Steel Axle Turnings	9.50 to 10.00
Machine Shop Turnings	9.50 to 10.00
Cast Borings	7.50 to 8.00
Mixed Borings, &c	7.50 to 8.00
No. 1 Mill	8.50 to 9.00
No. 2 Mill	7.50 to 8.00
No. 1 Boilers, cut to Sheets and Rings	9.50 to 10.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00

Metals.—Sheet Zinc has been advanced 10 cents per hundred lbs. Demand for Copper continues strong, with large business being taken for August and September delivery, at prevailing quotations. Pig Tin is slightly weaker, but prices are nominally unchanged. Slight concessions are being made on Lead in this territory, and Antimony is off 1c. We quote: Casting Copper, 18¾c. to 18⅞c.; Lake, 18⅞c. to 19¼c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 42¼c. to 42¾c.; small lots, 43¼c. to 43½c.; Spelter, prompt delivery, 6.15c. to 6.25c., for car lots; Lead, Desilverized, 6.10c. to 6.20c., for 50-ton lots; Corroding, 6.60c. to 6.70c., for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Cookson's Antimony, 32c., and other grades, 29c. to 30c.; Sheet Zinc is $7.75 list, f.o.b. Lasalle, in car lots of 60-lb. casks. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 4¾c.; Tea Lead, 4½c.; Zinc, 4½c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½.

The Mark Mfg. Company, manufacturer of Merchant Pipe and Boiler Tubes, has removed its office from the First National Bank Building, Chicago, to its plant at Evanston, Ill.

Philadelphia.

REAL ESTATE TRUST BUILDING, June 12, 1906.

The Iron and Steel markets maintain a strong front and in spite of some adverse influences there are no evidences of weakness. The demand is a little spotty, but Pig Iron, which is the backbone of the entire business, is as scarce and as strong as it has been at any time for a year past. This is really a remarkable fact when it is considered that prices are $1 per ton dearer and that production is materially larger than it was at this date in 1905. In view of the many unfavorable happenings during the past three or four months it seems like extreme optimism to expect a continuance of unbroken activity, but the indications at this time, if not all favorable, are certainly not unfavorable, so that there is no attempt to discount the future, either by heavy buying or by attempts to force sales for late deliveries. It is considered about an even thing on both sides, and as there are no stocks to carry it will not be difficult to maintain prices until there are some indications that a change is pending. For the present there seems to be nothing of this kind in sight and in all probability next week's report will be of the same general tenor as those of the past several weeks. The Government crop report, which was issued yesterday, is on the whole favorable. The average is not quite as good as last year, but the critical period will be during the next 30 days, during which it may be materially improved or it may deteriorate. Business to some extent has been held in abeyance pending this report, and it is hardly likely that very large operations will be entered upon until the next and final report for the year, which will be published July 20. Crops will be more to the country this year than is usually the case, although they are always important. The loss in the foreign meat trade will be heavy and we cannot afford to lose much in cereals and cotton. The large output of gold in Alaska, however, will be an important asset, but in any case the next 30 to 60 days will do much to determine the character of business for a long time to come.

Pig Iron.—A fair degree of activity has characterized the market during the past week. It seems to be a neck and neck race between supply and demand, with very little to show which will be the final winner. The demand includes all grades, the scarcest at the moment being Basic Iron, on which premiums have been paid on June and July deliveries. Everything goes, however, and it needs very little effort to get full prices for good material, while even the off grades command full figures in proportion. It will be an interesting problem to see what next month will develop. The mid-summer holidays, stock taking, repairs, &c., will probably cut down consumption to some extent and it is not unlikely that furnaces will catch up with their deliveries and possibly get a little iron ahead. The course of the market for the remainder of the year will, however, depend a good deal upon the course of events during July, for which reason business in the meanwhile will probably be, as it has been for several weeks past, of a hand-to-mouth character. Reports from the more important consuming interests are satisfactory, so that unless something occurs to change the entire situation there will not be much change in prices during 1906, although the chances for an advance are not regarded as favorable. They are already at the highest point reached since 1903, and with a much larger production it is believed that present quotations are high enough for safety. Sales during the week have been of

a very even, well distributed character, including all grades, at pretty full prices for June and July shipments, and tending a little toward the inside figures for deferred deliveries. For Philadelphia and nearby deliveries the range would be about as follows:

No. 1 X Foundry	$19.25 to $19.50
No. 2 X Foundry	18.50 to 18.75
No. 2 Plain	18.00 to 18.25
Standard Gray Forge	16.25 to 16.50
Ordinary Gray Forge	15.75 to 16.00
Basic	17.60 to 17.85
Low Phosphorus	24.50 to 25.00
Malleable	18.75 to 19.25
Bessemer	19.85 to 20.00
Lake Superior Charcoal	21.00 to 21.50

Steel Alloys.—The excitement has all died out and prices are about normal. Spiegeleisen is offered at $31 to $32, and Ferro for the last half at $72.50 to $75, but spot or July deliveries are held at $85 to $90.

Steel.—There is a good demand with a very liberal distribution of orders at about $29 for Open Hearth Steel and $32 to $33 for Forging Billets.

Plates.—The demand keeps up to a full average of the past few weeks with good prospects for the immediate future. A contract for 6000 tons of Riveted Pipe is to be awarded to-day, and it is probable that some of the local mills will get the order for the Plates; at any rate it will be 6000 tons to some mill. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Extra per 100 pounds.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00

Structural Material.—There are no new features in this department. There is plenty of business and mills are fully employed, although they are now making fairly good deliveries. Prices are unchanged, as follows: Beams, Channels and Angles, 1.83½c. to 2c., delivered.

Bars.—The demand is not as good as could be desired, although at this season more or less dullness is expected. Specifications are not as prompt as they have been, although some mills manage to run full, while others have to skirmish around pretty sharply to make single turn. It is what may be called a waiting market, although as a rule prices are steady at 1.63½c. to 1.68½c. for either Refined Iron or Soft Steel.

Sheets.—The demand is quite active, with some pressure for prompt shipments. Prices are firm and for good sized lots are quoted as follows, small and medium sized lots taking a tenth more: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—There is no distinct change in prices, but the feeling is a little better and in some cases buyers are willing to advance their bids when they can get the kind of material they want. A fair average of the market would be about as follows, representing bids and offers for deliveries in buyers' yards:

Scrap Steel Rails and Crops	$16.25 to $16.50
No. 1 Steel Scrap	15.75 to 16.25
Low Phosphorus Scrap	20.50 to 21.00
Old Steel Axles	19.00 to 20.00
Old Iron Axles	25.00 to 25.50
Old Iron Rails	20.50 to 21.00
Old Car Wheels	16.75 to 17.25
Choice Scrap, R. R. No. 1 Wrought	18.00 to 18.50
Choice No. 1 Yard Scrap	16.00 to 16.50
Long and Short	15.00 to 15.50
Machinery Scrap	15.50 to 16.00
Wrought Iron Pipe	13.00 to 13.50
No. 1 Forge Fire Scrap	14.00 to 14.50
No. 2 Light Ordinary	10.00 to 11.00
Wrought Turnings	12.50 to 13.00
Axle Turnings, Choice Heavy	13.00 to 13.50
Stove Plate	11.50 to 12.00
Cast Borings	9.50 to 9.75

According to statements in the daily press, Thomas A. Edison has found important cobalt deposits in North Carolina, as the result of which he says he will be able to reduce the cost of storage batteries in automobiles 50 per cent. If this is found to be true it will relieve to a great extent the handicap which electric vehicles have been under on account of the heavy storage batteries that had to be put in them.

Pittsburgh.

PARK BUILDING, June 13, 1906.—(*By Telegraph.*)

Pig Iron.—Actual sales of Bessemer Pig Iron made since our last report include 17,500 tons to the Republic Iron & Steel Company for third quarter delivery, 5000 tons to the Sharon Steel Hoop Company and 1500 tons to the Otis Steel Company, all made by the Bessemer Pig Iron Association, at $17.25, Valley furnace. The association has also sold 3000 tons of Basic Iron to the Sharon Steel Hoop Company for third quarter delivery at $17, Valley furnace. In addition the Cambria Steel Company is reported to have bought 90,000 tons of Bessemer and Basic Iron from a local interest, deliveries being 15,000 tons a month for six months, commencing July. The United States Steel Corporation has not bought any Bessemer Iron for July or August, and it is possible it will not need any for those two months, as a number of its plants will probably close during part of July for inventory and repairs. The supply of Bessemer and Basic Iron for June and July is pretty well sold up, but there is Iron available for delivery commencing with August. There is not much buying of Foundry Iron, but consumers are specifying liberally on contracts. We quote Northern No. 2 Foundry at $16.25 to $16.50, but on desirable tonnage it is possible that $16 at furnace might be named by some sellers. Forge Iron is quiet and we quote Northern brands at $15.50, Valley furnace, or $16.35, Pittsburgh.

Steel.—The scarcity of Steel making Pig Irons has had the effect of strengthening the Steel market, and Bessemer Billets are now very firm at $26.50 to $27, Pittsburgh. Open Hearth Billets continue scarce, and bring $28 or higher. Sheet and Tin Bars are still quoted at $28, Pittsburgh, for long lengths. The present scarcity of Sheet and Tin Bars will likely be relieved by August at the latest, as by that time the Republic Iron & Steel Company and the Youngstown Sheet & Tube Company will be producers.

(*By Mail.*)

Sensational reports have been printed in the daily press to the effect that 250,000 tons of Bessemer and Basic Iron have been sold in the last few days to the Pennsylvania, Lackawanna and Cambria Steel companies. These reports are almost wholly devoid of truth. The Pennsylvania and Lackawanna companies are said to be inquiring for Bessemer and Basic Pig Iron, but so far have not bought a ton and may not buy any. The Jones & Laughlin Steel Company is also reported to have bought a large tonnage of Bessemer Iron in the past week, but this is also untrue, as this company has not bought any Iron since it made a contract with the Sharpsville Furnace Company for its entire output for balance of this year. Actual sales made during the week comprise 17,500 tons of Bessemer, sold by the Bessemer Pig Iron Association to the Republic Iron & Steel Company and 5000 tons of Bessemer to the Sharon Steel Hoop Company for delivery in third quarter at $17.25 at Valley furnace and 1500 tons to the Otis Steel Company. The Basic Iron was sold at $17, Valley furnace. The Cambria Steel Company is reported to have bought 90,000 tons of Bessemer and Basic Iron from W. P. Snyder & Co. for balance of the year, deliveries to be 15,000 tons a month, commencing July, but this sale has not been officially confirmed. The United States Steel Corporation has not bought any Bessemer Iron for July or August delivery, but is short of metal at its plants and will undoubtedly need a large tonnage for both of those months. It is understood that with the heavy sales of Bessemer Iron made by the Bessemer Pig Iron Association to the Republic Iron & Steel Company in the last month, and which aggregate over 60,000 tons for deliveries running from June until September, the association is practically sold up and has little or no Iron to spare for delivery this side of October. Bessemer Iron is so scarce for June and July delivery that small lots for prompt shipment are said to be bringing as high as $17.75 at Valley furnace. Basic Iron is very firm at $17, Valley furnace, some sellers asking higher prices. Foundry Iron continues dull and neglected, Northern brands of No. 2 being freely offered at $16, Valley furnace, and on a firm offer this might be shaded. Forge Iron is also very quiet, Northern brands being held at about $15.50, Valley, or $16.35, Pittsburgh. The scarcity of Bessemer Iron has had the effect of strengthening the Steel market. Bessemer Billets, which were offered last week as low as $26, are higher in price, $26.50 to $27, Pittsburgh, now being quoted. Open Hearth Billets continue very scarce and are held at $28 and higher. The Carnegie Steel Company has not yet announced its price on Sheet or Tin Bars for third quarter delivery and it is not known at this time whether any reduction will be made. The Republic Iron & Steel Company and Youngstown Sheet & Tube Company are in the market as sellers of Sheet and Tin Bars for delivery after July and this may affect the situation. The Scrap trade has quieted down again, but Coke continues fairly active. In Finished Iron and Steel the volume of business is large and on Sheets and Tin Plate is much heavier at present than usual at this season of the year.

Ferromanganese.—Prices are weak and there is very little demand. We quote foreign Ferro for June and July

delivery at $70 to $75, delivered, Pittsburgh. For delivery over last half of the year lower prices would be made.

Muck Bar.—The market continues very quiet, and in the absence of sales we quote best grades, made from all Pig Iron, at $28 to $28.50, Pittsburgh.

Rods.—We quote Bessemer and Open Hearth Rods at $34 to $34.50 and Chain Rods $35, Pittsburgh.

Skelp.—There is practically no new business being placed and a local mill is closed down for lack of orders. We quote: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—During the week the McClintic-Marshall Construction Company booked about 6000 tons and is figuring on other large contracts. There has been a large increase in the rolling capacity of Structural Shapes and the mills are now making prompt deliveries. Prices are firm and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Steel Rails.—There is a heavy inquiry for Steel Rails, mostly for next year's delivery. Among orders recently booked by the Carnegie Steel Company are 36,000 tons for the Missouri Pacific, of which 27,000 tons are for next year; also 4400 tons for the Indianapolis, New Castle & Toledo traction line, 8000 tons for the Baltimore & Ohio and 1320 tons for the Illinois Central electric line. We also note an active demand for Light Rails and prices are very firm. We quote Standard Sections at $28 at mill. We quote Light Rails as follows: 8-lb., $36; 10-lb., $32; 12-lb., $30; 16-lb., $29; 20-lb., $28.50; 25 to 45 lbs., $27.50 to $28, maker's mill.

Plates.—The Plate market is somewhat quiet and specifications coming in are somewhat below the rolling capacity of the mills. On Sheared Plates the mills can make very prompt deliveries, but on Universal Plates are from three to four weeks behind. Official prices continue to be shaded by the smaller mills from $1 to $2 a ton on the narrow sizes. These official prices are as follows: Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—The demand continues enormously heavy and most of the mills are filled up for three or four months ahead. Specifications on old contracts are coming in freely and shipments of both Black and Galvanized Sheets by the mills are much heavier than usual at this season of the year. We are advised that the recent advance of $2 a ton in prices of Black and Galvanized Sheets is being firmly held. We quote: Nos. 10 to 12 gauge, 2.10c.; Nos. 13 and 14, 2.15c.; Nos. 15 and 16, 2.20c.; Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.65c., and No. 30, 2.75c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.80c., and No. 30, 4.05c. We quote No. 28 Gauge Painted Roofing Sheets at $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $3.10 per square for 2-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Iron and Steel Bars.—Reports are that some of the large consumers of Steel Bars have become tired of waiting for a concession in prices of $2 a ton that was given some time ago to the implement makers and have commenced to place their season contracts, a leading local interest being credited with having booked upward of 100,000 tons of Steel Bars in the past week or ten days. It now seems absolutely certain that the present price of 1.50c. on Steel Bars will be held absolutely. New tonnage in Iron Bars is light and some of the mills are in need of specifications. We quote Iron and Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

Hoops and Bands.—A fair amount of new business is being placed at full official prices, but the mills are working mostly on specification on contracts, which are coming in quite freely. We quote Steel Hoops at 1.90c. and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—Most consumers are covered by old contracts, some of which were placed when prices were as low as $3.35 per box, and the amount of new business being placed is relatively small, but is bringing the full official price. The Tin Plate mills have their product pretty well sold up for the next three or four months. We quote Tin Plate at $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on which price a rebate of 5c. a box is allowed for carloads and larger lots.

Railroad Spikes.—The demand is enormously heavy and the makers are from three to four months behind in shipments. One large local manufacturer is out of the market as a seller, having his entire product sold up for practically the balance of this year. The burning of the Severance plant at Glassport has decreased the local supply of Spikes and has thrown more tonnage to the other mills. Prices have shown a sharp advance and we now quote $2.15 to $2.20 per 100 lbs, f.o.b. Pittsburgh, the lower price being absolutely minimum of the market.

Merchant Pipe.—The Philadelphia Company, supplier of natural gas, has placed a contract with the National Tube Company for 25 to 35 miles of 16-inch Line Pipe for a gas line for delivery to points in Pennsylvania and West Virginia. The demand for Merchant sizes is quite active and the mills are pretty well filled up for two or three months ahead. Prices are unchanged, the extreme discount on Merchant sizes of Steel Pipe remaining at 81 and 5 per cent. off to the large trade. Official discounts for carloads, which continue to be shaded one point or more, are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
	%	%	%	%
⅛ and ¼ inch	72	56	69	53
⅜ inch	74	60	71	57
½ inch	76	64	73	61
¾ to 6 inches	80	70	77½	67½
7 to 12 inches	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ inch	65	53	62	50
½ to 4 inches	72	60	69	57
4½ to 8 inches	68	56	65	53
Double extra strong, plain ends:				
½ to 8 inches	61	50	58	47

Boiler Tubes.—The demand for Locomotive and Merchant Tubes is active and consumers are specifying liberally on contracts. Discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	45	50
1¾ to 2¼ inches	45	62
2½ inches	50	64
2¾ to 5 inches	57	70
6 to 13 inches	45	62

Iron and Steel Scrap.—Following the recent heavy purchases of heavy Steel Scrap and Rerolling Rails by the Carnegie Steel Company and the Sharon Steel Hoop Company, the Scrap market has quieted down somewhat, the demand being rather light. Prices, however, are fairly strong, and we quote: Heavy Melting Scrap, $15.75 to $16; No. 1 Wrought Scrap, $17.25 to $17.50; Machinery Cast Scrap, $15.75; Bundled Sheet Scrap, $13.50 to $13.75; Old Steel Rails, short pieces, $15.75 to $16; Old Steel Rails, Rerollers, $17.50 to $18; Cast Iron Borings, $8.50; Old Car Wheels, $17.25 to $17.50; Wrought Turnings, $12; Old Iron Axles, $25.50 to $26; Old Steel Axles, $21; Stove Plate, $10.75 to $11; Axle Turnings, $13, all f.o.b. Pittsburgh, and all in gross tons.

Coke.—There is only a fair demand for Furnace and Foundry Coke, but it is somewhat better than a week or two ago. We note a sale of a round tonnage of Connellsville Furnace Coke for delivery over last half of the year at $2.35 a ton at oven. We quote best grades of Connellsville Furnace Coke at $2.30 to $2.35, and 72-hour Connellsville Foundry Coke at $2.65 to $2.75 a ton, at oven.

The American Pig Iron Storage Warrant Company had 21,300 tons of iron in warrant yards on May 31, having delivered 3700 tons and received 500 tons in May.

Cincinnati.

FIFTH AND MAIN STS., June 13, 1906.—(*By Telegraph.*)

Pig Iron.—The situation in many respects is reported as being far from satisfactory, especially along the line of activity. Conditions are strongly in contrast with each other, in that they appear to be strong and at the same time weak. The strong feature lies in the fact that the Southern furnaces are accumulating no stock, and the supply in the yards shows no increase. The weak feature is the fact that the apathy that has characterized the situation for the past month or so is still evident and very few sales of any considerable tonnage have been made during this period. The undercurrent of trade, however, is apparently fairly strong, but it looks as though there was nothing to be expected so far as a heavy buying movement is concerned until conditions force a change. Bessemer and Malleable Irons have been in active demand during the past week, and several of the Ohio furnaces are said to have made some very close prices on these particular grades. It is reported that one of the large producers of the South has advanced the price of Gray Forge 50c. per ton. The large melters are apparently keeping in close touch with the situation, ready to act whenever satisfied that the bottom has been reached. A sale is reported of 3000 to 4000 tons of Southern Iron to a consumer in Chicago, said to have gone at $14, Birmingham. It it also reported that this same melter is in the market for probably 50,000 tons, but there appears to be a proviso attached to it. About 4000 tons are wanted by a large consumer of Indianapolis for delivery covering last half. Freight rates from Hanging Rock district to Cincinnati are $1.15 and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$17.25 to $17.50
Southern Coke, No. 2	16.75 to 17.00
Southern Coke, No. 3	16.25 to 16.50
Southern Coke, No. 4	15.75 to 16.00
Southern Coke, No. 1 Soft	17.25 to 17.50
Southern Coke, No. 2 Soft	16.75 to 17.00
Southern Coke, Gray Forge	15.00 to 15.25
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1 (8 per cent. Silicon)	21.65 to 22.15
Lake Superior Coke, No. 1	17.40 to 17.65
Lake Superior Coke, No. 2	16.90 to 17.15
Lake Superior Coke, No. 3	16.40 to 16.65
Car Wheel Irons.	
Standard Southern Car Wheel	$24.00 to $24.25
Lake Superior Car Wheel	22.50 to 22.75

Coke.—The demand is better this week. Quite a number of founders are closing their half yearly contracts. The supply is abundant and prices are easy. We quote best brands of Connellsville and Virginia Foundry from $2.75 to $2.85, f.o.b. ovens.

Finished Iron and Steel.—The demand is reported to be slightly easier and new contracts along Structural lines are coming forward more slowly. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ inch or heavier, 1.83c., in carload lots.

Old Material.—The Scrap market is reported weak and business generally is dull. It is said that the railroads are holding back their lists, waiting for higher prices. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $14.50 per net ton; Cast Borings, $5 to $6 per net ton; Steel Turnings, $7 to $8 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $19 to $20 per gross ton; Steel Rails, rolling mill lengths, $14 to $15 per gross ton; Relaying Rails, 56 lbs. and upward, $28 to $29 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $17 to $18 per gross ton; Low Phosphorus Scrap, $18 to $19 per gross ton.

Birmingham.

BIRMINGHAM, ALA., June 11, 1906.

Pig Iron.—A slight improvement both in inquiries and orders booked this week is reported by the producers. It is stated that no orders for large tonnage have been placed, but in the aggregate a comparatively nice business has been done. The furnace people are as strong as ever in their assertions that the price of $14 for No. 2 Foundry is being strictly maintained and deny the published report that manufacturers not in the agreement are making concessions of 25c. per ton. A large consumer of Foundry Iron in Birmingham, whose business is eagerly sought by all the furnaces, reports that inquiries this week to every producer in the district failed to bring out a lower price than $14, which seems to indicate very conclusively that the price for delivery here is still firmly established at that figure regardless of what prices may be made when it comes in competition with Northern Iron. The fact that several furnaces are out of blast undergoing repairs, and the further fact that more stacks are running on Basic Iron than ever before, tend to considerably reduce the output of Foundry Iron. Local consumers are experiencing much difficulty in securing delivery of desired grades, which has forced them in many instances to use a mixture of Silvery and Forge, and the yards are now probably clearer of these off grades than in several years, while No. 2 is so scarce as to be almost accepted as legal tender.

Cast Iron Pipe.—This section is rapidly forging to the front as a producer of Cast Iron Pipe, and the latest addition to the list of manufacturers is the Sheffield Cast Iron Pipe & Foundry Company, at Sheffield, which made its first cast May 31. The plant is not in full operation yet, but expects to be shortly, and when completed it will be one of the largest and most modern foundries in the South making Water and Gas Pipe. No large orders are reported this week, but numerous small ones have been entered. While all the shops have sold far ahead and are not now in position to promise delivery under 60 or 90 days, it is understood the following prices are being maintained on Water Pipe: 4 to 6 inch, $27 to $27.50; 8 to 12 inch, $26.50 to $27; over 12-inch, $25. Gas Pipe $1 per ton extra.

Old Material.—Machinery Cast continues the leading seller, with other grades comparatively dull. Especially is this true of Wrought Scrap, the users of this grade having apparently withdrawn from this market entirely for the time being. While no change has been made in quotations, orders could probably be placed at somewhat lower figures than dealers' prices given below:

Old Iron Rails	$19.00 to $19.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	16.00 to 17.00
Old Car Wheels	17.00 to 17.50
No. 1 Railroad Wrought	16.00 to 16.50
No. 2 Railroad Wrought	15.00 to 15.50
No. 1 Country Wrought	13.75 to 14.25
No. 2 Country Wrought	11.75 to 12.25
Wrought Pipe and Flues	11.75 to 12.25
Railroad Malleable	12.00 to 12.50
No. 1 Steel	12.00 to 12.50
No. 1 Machinery Cast	11.00 to 11.50
Stove Plate and Light Cast	9.00 to 9.50

It is stated that the Tennessee and Republic companies are to make public within the next week or so the improvements to be made to the plants in this district and the nature of the new plants to be erected here, the financial arrangements having been practically concluded.

The German Iron Market.

BERLIN, May 31, 1906.

The market for Pig Iron is extremely strong, and the indications are that it will grow stronger. Many reports say that the scarcity of supplies verges upon a famine. Nothing can more aptly characterize the present situation than to state that the dealers in Luxemburg Pig, who created a great sensation about two months ago by reducing prices in order to meet English competition at North German seaports, have latterly been compelled to buy English Pig themselves. The Luxemburg furnaces can no longer supply them with the quantities demanded, and they have had to turn to England for the replenishment of their stocks. About 30,000 tons of English Pig had been taken by them by the middle of this month, and the buying still continues.

All branches of the German hardware trade are well employed, and prices are ruling firm. The great activity in building throughout the Empire creates a heavy demand for builders' hardware. Wire and wire nail manufacturers report business as brisk, but prices are somewhat disturbed by the underbidding of independent makers. Manufacturers of articles having brass or copper parts complain, too, that the advances in the prices of these metals have wiped out their profits. A steady improvement in the business of machine tool and other machinery manufacturers is to be mentioned; but the immediate problem for them is to establish new selling prices in proportion to the recent advances in the prices of Iron and Steel. Considerable new capital is going into new and old metal working establishments, about $2,500,000 having been reported for April. Electrical works are more actively employed than last year. The strikes and lockouts in the metal working industries of several important centers are now in a fair way of being settled.

The rejection of foreign orders for half finished goods by the Steel Verband, mentioned recently, has already begun to tell on the exports of Iron. The March figures, the publication of which was greatly delayed by reason of the new and complicated classifications of the new tariff law, show a heavy reduction on those of February. The outgo reached only 274,239 tons, as against 382,638 tons in February. The actual export for March was most likely greater than the figures here quoted, many forms of Iron manufactures having been transferred to schedules where they are not taken account of as Iron. It is very probable that the April statistics of exports will be still lighter than March.

Cleveland.

CLEVELAND, OHIO, June 11, 1906.

Iron Ore.—If the same rate of Ore shipments is continued during the remainder of the season vessel owners and shippers believe it will be easily possible to reach to 38,000,000 to 40,000,000 tons. If this is to be accomplished it will mean an average movement during the remaining months of the season of approximately 5,500,000 tons per month. Allowance should be made, however, for a falling off in October and November, when the grain and coal movement will take away a certain portion of the lake fleet. Some complaint is heard relative to the dispatch given the boats at the upper end of the lakes, but this is said to be due to car shortage and the recent heavy rains, which have delayed operations at the mines. Rates remain unchanged at 75c. from Duluth, 70c. from Marquette and 60c. from Escanaba to Ohio ports.

Pig Iron.—The market is active and strong, higher prices being asked for some grades. In a few cases there has been a change from Foundry to Steel making Irons, which has had some effect on the supply of Foundry Iron. There is an active inquiry and asking prices are 25c. to 50c. a ton higher than a week ago. The market for Basic is steady at $17 in the Valleys. There is a good demand for Bessemer at $17.25 in the Valleys. Coke is firm at unchanged prices.

Finished Iron and Steel.—Since the $2 advance in Sheets sales have been made at 3.55c. for No. 28 Galvanized and 2.50c. for No. 28 Black, both Pittsburgh. The Plate market is steady at unchanged prices. Forging Billets are scarce, and mills in a position to make quick delivery have no difficulty in commanding premium prices. Sales are reported at $35, Pittsburgh. Steel Bars are steady at 1.50c., Pittsburgh. The American Shipbuilding Company's contracts for new steamers closed last week include two twin boats of 520 feet keel, 540 feet over all and beam 54 feet, with molded depth 31 feet. Both will be designed for bulk freight and will cost $375,000 each. They will be built in Bay City. A third boat will be a coarse freighter, with the following dimensions: 420 feet keel, 440 feet over all, 52 feet beam and 28 feet deep. It will cost $290,000.

Old Material.—The market for Old Material has been rather quiet during the week. Mills are looking forward to inventories and for that reason are practically out of the market. Purchases of material are very small, and with one or two exceptions prices are unchanged. The following are dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, $14.50 to $15.50; Old Iron Rails (nominal), $21 to $22; Iron Car Axles (nominal), $18.50 to $19.50; Heavy Melting Steel, $14.50. Net tons: Cast Borings, $8.50 to $9; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $16; No. 1 Cast, $14 to $14.50; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

New York.

NEW YORK, June 13, 1906.

Pig Iron.—Outside of one lot of 3000 tons of Iron for a Cast Iron Pipe shop no large blocks have been placed, although some good sized orders are under negotiations. The market continues steady. We quote Northern Pig Iron No. 1, $18.50 to $19; No. 2 Foundry, $18 to $18.50, and No. 2 Plain, $17.50 to $18. Southern Iron is quoted $18.25 to $18.50 for No. 1, and $17.25 to $17.50 for No. 2.

Steel Rails.—It has been a quiet week for 1906 business; in fact, there is little more to talk about for this year. Miscellaneous orders in the past week foot up 9000 tons for 1906 delivery, including some business for frog and switch works. The Wisconsin Central is in the market for 2500 tons for 1907, the Interborough Railroad for 4000 tons and the Ann Arbor & Michigan for a portion of its requirements. The St. Louis & San Francisco is negotiating for 23,000 tons for 1907, and the Mexican Central and the National of Mexico have asked for a total of about 9000 tons. Export business booked in the week amounts to 18,000 or 19,000 tons.

Structural Material.—The mills have been working out of the condition of a number of months past and deliveries are now promised in from 30 to 90 days. Business is coming in freely and from a variety of sources, though no large contracts are reported in this market. The fabricating companies have found a lull in contracting in the past week and the business booked has been on smaller jobs. A sugar house in Porto Rico has been taken by Milliken Brothers, but business outside the country is generally quiet. Some railroad bridge work is pending, both for Eastern and Western roads, but the tonnages are not large in any case. In New York City a question has been raised concerning the bond in $1,500,000 offered by the lowest bidder for the superstructure of the Manhattan Bridge and an effort is being made to award the contract to another bidder. The question has also come up whether the eight-hour law recently passed at Albany will affect this work, on which bids were submitted before the passage of the act. Among inquiries pending are several for Structural Steel for buildings in Central Western cities, including Cincinnati, Cleveland and Buffalo. We quote on tidewater deliveries the following prices for shipments from mills: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 inches the extra is 0.10c., and on Angles over 6 inches 0.10c. Beams and Channels out of stock are sold at 2½c.

Bars.—A considerably improved demand is reported this week, but as far as can be learned no contracting is being done. Purchases are confined to immediate or early requirements. While 1.64½c., tidewater, is maintained by the leading manufacturers of both Iron and Steel Bars, concessions on Iron have been made by a few of the mills, particularly by makers of a limited range of sizes. A fact which has some bearing on the Bar Iron market is the recent renewal of good contracts on Bolts and Nuts at an advance of 5 per cent. on the prices at which the expiring contracts were placed.

Plates.—Local business is light. The shipyards are taking but little new work, and the shops consuming Plates either have their wants supplied by contracts still running or purchase only in small quantities. The demand is considerably better for Universal than for Sheared Plates. Manufacturers of Universal Plates are about four weeks in arrears on deliveries. Quotations are as follows at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—Some of the leading foundries have their capacity covered so far into the future that they are not now making bids on any contracts of consequence which are coming out. The present is a very trying position for Pipe manufacturers, and one to which they are hardly accustomed, as they are steadily being obliged to turn away valued customers whose orders they would like to fill. Absolutely no Pipe is in stock, however, and the output is mortgaged to those who have placed contracts. The demand continues heavy from all consuming sources. Prices are stiffer, if anything, but the quotation of $30.50 per net ton at tidewater is continued for carload lots of 6-inch.

Old Material.—Dealers report a slightly improved situation. The railroad lists have been well taken, and consumers are now giving a little more attention to dealers' offers. Inquiries are in the market for several thousand tons of Heavy Cast Scrap, but stocks in local dealers' hands are small and the supply will have to come from outside points. Consumers of Steel Scrap are also feeling the market. Dealers are now inclined to believe that prices are scraping the bottom, and while the general list may be quiet for some little time any change is more likely to be in the direction of an advance than a decline. Approximate prices per gross ton for New York and vicinity are as follows:

Old Iron Rails	$19.50 to $20.50
Relaying Rails	25.50 to 26.00
Old Steel Rails, rerolling lengths	16.00 to 16.50
Old Steel Rails, short pieces	14.00 to 14.50
Heavy Melting Steel Scrap	14.00 to 14.50
Standard Hammered Iron Car Axles	23.50 to 24.00
Old Steel Car Axles	18.50 to 19.50
No. 1 Railroad Wrought	17.50 to 18.50
Iron Track Scrap	15.50 to 16.50
No. 1 Yard Wrought, long	16.00 to 16.50
No. 1 Yard Wrought, short	14.00 to 15.00
Wrought Pipe	12.00 to 12.50
Light Iron	9.00 to 10.00
Cast Borings	8.00 to 8.50
Wrought Turnings	11.00 to 11.50
Old Car Wheels	16.00 to 17.00
No. 1 Machinery Cast	14.00 to 14.50
Stove Plate	11.00 to 11.50
Grate Bars	9.00 to 9.50
Malleable Cast	15.00 to 15.50

Metal Market.

NEW YORK, June 13, 1906.

Pig Tin.—The little business transacted during the week was largely done by those having resale lots to dispose of. On Thursday of last week Tin sold at 40.10c., and on Friday a few small lots were sold at 40.25c. Monday the market reacted slightly, and a little was disposed of at 39.90c. A sharp break of £6 in the London market Tuesday brought out offerings at 38.70c., but even this price did not tempt buyers. To-day's London market is £176 7s. 6d. for spot, and £175 17s. 6d. for futures. Spot can be obtained in New York at 38.87½c. Tin is now going into store, and the period of premiums for spot is past. The arrivals so far this month aggregate 957 tons, and there are afloat 3145 tons. The Minneapolis, which will arrive next week, is bringing 1225 tons, which was purchased at much higher prices than those now current. This is nearly a record cargo. Those well informed in trade matters look for lower prices, as consumption during the summer months is usually small.

Copper.—The market continues very firm, although some small lots of Lake have been sold at 18.75c. for nearby

and July shipments. The general range of quotations is unchanged at 18.75c. to 19c. for spot Lake; futures can be obtained at 18.62½c. to 18.87½c. For spot Electrolytic 18.62½c. to 18.87½c. is asked, futures being held at 18.50c. to 18.62½c. Casting grades may be had at 18.12½c. to 18.50c. We hear of high grade Lake being held at 18.75c. for the middle of September shipment. The foreign demand is exceptionally heavy and promises to continue. The total exports from this country during May were 19,260 tons. The exports for the first five months of this year aggregate 83,131 tons, against 107,705 tons during the corresponding months last year. During last year, however, 27,000 tons were shipped to the Orient, showing that the present European demand is heavier than last year. The exports for the first 12 days of this month are large, being 8938 tons. The London market is firmer at £86 for spot and £84 15s. for futures. Best Selected is held at £89 15s., although sales of Electrolytic have been made this week on a basis of 19c., c.i.f. European points. The German consumers of Copper are very busy and taking metal in large quantities. As far as future business in this country is concerned there appears to be little doing, but it is well known that there are a number of consumers who may shortly come into the market.

Pig Lead.—The firmness which has characterized this market for the past month continues, stocks to arrive in New York commanding somewhat of a premium. Imported Lead can be purchased at about 5.90c., while domestic Lead is held at 6c. for spot. Lead to arrive in New York is held at 6.05c. to 6.10c. and scarce at that. The St. Louis market is firm at 5.92½c. bid with no takers. The American Smelting & Refining Company continues to quote 5.75c. governing old contracts. New business is only taken at price current on date of shipment. It appears that for the near future and for some time to come, unless conditions materially change, consumers on the Atlantic seaboard will be able to purchase foreign Lead cheaper than domestic. The London market is firm at £16 17s. 6d.

Spelter.—There has been a heavy inquiry for Spelter and considerable business has resulted. Some of this was done at 6.10c., but to-day there is little probability that any spot or nearby metal can be obtained under 6.15c. The St. Louis market is firm at 6c. to 6.05c. In London prices are without change at £27 15s.

Aluminum.—The principal producer of Aluminum continues to quote No. 1 Ingots at 35c. per lb.; No. 2 at 33c. Shipments, however, are still considerably delayed.

Quicksilver.—There is no change in the market, dealers holding flasks of 75 lbs. in 100-flask lots at $41 per flask and the usual advances for retail lots. San Francisco quotations remain unchanged at $40 per flask for domestic orders and $39 for export orders. In London Rothschild's price is unchanged at £7 5s.

Antimony.—There appears to be somewhat of a lull in the market and prices are lower at 25c. to 26c. for Hallett's and Cookson's; other grades are held at 24c. to 25c. On account of the large lots now on the market that show a handsome profit to the holders there is considerable irregularity. The London market is firm, however, and there is a likelihood that higher prices may again be the rule.

Nickel.—Prices are nominally unchanged, large lots being quoted at 40c. to 45c.; smaller quantities at 50c. to 60c.

Tin Plate.—The Tin Plate trade is dull, Terne Plate especially. At the same time shipments on old contracts are not going forward with the usual rapidity owing to the scarcity of Tin Plate Bars. The supply of Black Plate for tinning is extremely meager. For 100-lb. IC Coke Plates, f.o.b. New York, $3.94 is quoted; f.o.b. Pittsburgh, $3.75. In Swansea Welsh Plates are 3d. lower at 13s. 3d.

Old Metals.—Dealers in Scrap Metal are anxious to secure good sized lots of Copper Scrap and Lead. Business is dull on account of the small supplies available. For such lots as are being sold the following prices represent the general market:

	Cents.
Copper, Heavy Cut and Crucible	18.00 to 18.25
Copper, Heavy and Wire	17.75 to 18.00
Copper, Light and Bottoms	16.00 to 16.25
Brass, Heavy	12.50 to 12.75
Brass, Light	10.50 to 10.75
Heavy Machine Composition	16.50 to 17.00
Clean Brass Turnings	11.50 to 11.75
Composition Turnings	13.50 to 14.00
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.45 to 5.60
Tea Lead	5.20 to 5.35
Zinc Scrap	4.90 to 5.00

Differences of from 150 to 250 per cent. in the dielectric strength of commercial insulating materials of the same description are by no means rare. This seems to be due in no small measure to the conditions of the atmosphere prevailing at the time of the test, and as a result designers have to allow very considerable margins of safety. This means a high first cost and interest charges.

Iron and Industrial Stocks.

NEW YORK, June 12, 1906.

The week has been rather uneventful, the fluctuations in Colorado Fuel having been the most prominent feature. This stock sold at 61½ on Thursday, declined to 56 on Saturday, receded further to 54¾ on Monday, and on the same day rose to 58⅜, touching 59¼ on Tuesday and then declining to 56⅝. Locomotive common showed a range during the week from 70 to 73¼. Republic common advanced from 29⅜ to 31⅛ on Thursday, declined to 29¾ on Saturday and advanced to 31¼ on Monday. Steel preferred, which reached 107⅛ on Thursday, declined gradually during the week and touched 105⅞ on Monday, advancing subsequently to 106⅜. The range of prices on other active stocks was as follows: Car & Foundry common 41 to 42¼; Pressed Steel common 52 to 54; Railway Spring common 54¼ to 56¾; Republic preferred 104 to 105¼; Sloss-Sheffield common 78¼ to 81; Tennessee Coal 155 to 157½; Cast Iron Pipe 51 to 52¼. Last transactions in active stocks up to 1.30 p.m. to-day are reported at the following prices: Can common 7½, preferred 62½; Car & Foundry common 41¾, preferred 102¼; Locomotive common 71¾, preferred 116; Steel Foundries common 12⅛, preferred 46½; Colorado Fuel 57; Pressed Steel common 51½, preferred 99; Railway Spring common 54; Republic common 30½, preferred 105½; Sloss-Sheffield common 78; Tennessee Coal 156; United States Cast Iron Pipe common 51¼, preferred 95; United States Steel common 40⅛, preferred 105⅛.

The annual meeting of the Westinghouse Brake Company, Limited, was held in London, England, June 8. The balance sheet showed the net profits for the year ending December 31, 1905, after providing for all working expenses and making full provision for depreciation, were equivalent to $507,625, including $64,585 brought forward from the old account. This is a decrease of $6225 compared with 1904, but an increase of $22,035 compared with 1903. The total dividends paid during the year amounted to 20 per cent. on the $1,996,400 outstanding capital. After the payment of dividends and the transfer of $50,000 to the reserve account, there remained $58,360 to be carried forward to the new profit and loss account. The report states that the dividend received from the Russian Company for the year ending December 31, 1904, was included in the profits for the past year. The Westinghouse Air Brake Company, Pittsburgh, owns a considerable proportion of the capital stock of the foreign company. George Westinghouse, who is president of both companies, expects to return to Pittsburgh about July 10.

The Sloss-Sheffield Steel & Iron Company's statement for the quarter ended May 31 shows a decrease in surplus as compared with the corresponding period of last year. The surplus after dividends was $176,228, against $254,485 in the same quarter of last year. Decreased earnings are attributed to a shortage of labor.

Dividends.—Canadian Westinghouse Company has declared a quarterly dividend of 1½ per cent., payable July 3.

Standard Screw Company has declared a dividend of 6 per cent., payable semiannually in July and January.

American Smelting & Refining Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable July 2, and 1¾ per cent. on the common stock, payable July 16.

General Electric Company has declared the regular quarterly dividend of 2 per cent., payable July 16.

A quarterly dividend of 1½ per cent. has been declared on the preferred stock of J. G. White & Co., payable July 2.

Crucible Steel Company of America has declared a quarterly dividend of 1½ per cent. on its preferred stock.

Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable July 2.

Garvin Machine Company, New York, has declared a semiannual dividend of 3½ per cent., payable July 2.

The magnitude of the electrical industry is well shown in the following extract from a speech of Everett W. Burdett at Atlantic City, N. J., recently: "In electric enterprises the central station electric lighting investment alone already aggregates $700,000,000, involving an annual operating expense of nearly or quite $100,000,000, distributed among all classes of workmen and through every artery of trade. The census reports show that in the single year 1904 there was an output of new electrical apparatus of the value of more than $150,000,000. There are nearly 5000 central electric lighting stations. There are 23,000 miles of electric railways carrying each year over 5,000,000,000 passengers. Spoken words are transmitted through more than 5,000,000 miles of wire, by the use of more than 3,000,000 telephones, by which more than 5,000,000,000 messages are transmitted yearly."

The Iron Molders' Strike.

Although 49 founders in the Chicago district, operating 52 shops, have signed the agreement submitted by the Conference Board of the Iron Molders' Union of North America, not one of the National Founders' Association has yet capitulated. These foundries are operating at an average of 65 per cent. of their capacity and nonunion molders are arriving daily to take the places of the strikers. In these shops 500 men are out, and considering the increased daily output of the nonunion men it is estimated that 400 men will be sufficient to operate these plants at their capacity. Practically all of the shops that have signed do job work and none is affiliated with the National Founders' Association. Due to the restricted output and increased labor cost, the prices of casting in the district have materially increased, and a movement is well under way among the members in the Chicago branch of the National Metal Trades Association to erect and operate a nonunion jobbing foundry of sufficient capacity to supply with castings the 110 shops enrolled. It may be stated that in one open shop in Chicago more iron is poured in a day than all the shops that have signed the union agreement pour in a month.

The Association's Summary.

In a letter to its members under date of June 11, the National Founders' Association summarizes the conditions at the various foundry centers in which the Iron Molders' Union is carrying on strikes for the closed shop, the nine-hour day and an increase in wages. From this statement the information given below is gleaned:

At Buffalo the original demands were for a nine-hour day, increased wages and the signing of a closed shop agreement. The nine-hour demand has now been given up by the union and in some instances the demand for a written agreement has been withdrawn. Of the 40 foundries in Buffalo 13 have been run as open shops and are not involved in the present strike. In addition, 15 firms have operated independently of the union since May 1. Eleven foundries, including a number of small shops, have made adjustments with the union and are operating on a ten-hour basis, though paying the union minimum of $3. These foundries have not signed a closed shop agreement.

The five firms in Milwaukee which have made various forms of settlement with the union employ 153 molders. Seventeen firms, employing 1200 molders and coremakers, are standing out. In addition important malleable and agricultural concerns, employing over 1000 men, are operating nonunion. It is considered that the 17 Milwaukee foundries now operating as open shops are making good progress. These shops are the following: The Allis-Chalmers Company, Falk Company, Smith Steel Casting Company, Prescott Steam Pump Company, Dutcher Company, Schwab & Sons Company, Milwaukee Steel Casting Company, Western Malleable & Gray Iron Foundry, Thos. Ashton & Sons Company, Bucyrus Company, Filer & Stowell Company, Pawling & Harnischfeger, Vilter Mfg. Company, Hoffman Mfg. Company, Sheriffs Mfg. Company, Stowell Mfg. & Foundry Company and National Brake & Electric Company.

The Toledo foundrymen co-operating with the National Founders' Association report under date of June 8 that some of the strikers who were not union men but who went out have asked for positions. Nine foundries have posted the open shop notice and none of them has receded from this position.

One Scranton, Pa., shop, employing three or four molders, signed an agreement with the union prior to May 1. All other shops in that city from which the molders went out on strike are being operated with independent men. A shop at Carbondale, Pa., 16 miles from Scranton, which has never had an agreement with the union, granted the minimum wage and a nine-hour day, but without signing an agreement. At Honesdale, Pa., a foundry employing three or four molders continued at work under the same terms as the Carbondale foundry referred to above. It had been reported by the union that in Scranton and vicinity the demands had been generally conceded, though without the signing of a closed shop agreement.

Concerning the report that the Philadelphia foundries have not their full quota of men, it is stated on behalf of the manufacturers that this is due to the fact that molding machines have been introduced to such an extent that many highly skilled molders have been dispensed with. The less skilled men operating machines have made a greater output than the skilled men who left the shops. Since the strike of last year more apprentices have been introduced, the number depending upon the requirements of the shop in each case.

At New Orleans one foundry firm resigned from the local employers' association, but the other companies are maintaining their position. About 10 union molders are at work in the shop which has granted the demand and 100 molders are out. Ten foundries were involved in the strike.

At Boston one company, employing 26 molders and coremakers, made an adjustment with its men and they returned to work on May 4. A steel foundry at Chelsea, not a member of the National Founders 'Association, also made arrangements with its men. A Boston foundry employing from 75 to 100 molders and coremakers is operating as an open shop.

The molders at Pittsburgh are still at work. The demand was for an increase of 20 cents a day and the signing of an agreement by each shop recognizing a $3.50 minimum for floor and bench molders and coremakers. The foundrymen in every case have refused to grant it.

At Beloit, Wis., one of the large firms affected is now pouring nearly its normal output and the other foundries are increasing their production.

The conditions at Minneapolis and St. Paul are reported favorable for the proprietors. Since May 1 one firm employing 4 men and an apprentice has signed the union agreement. All other firms affected by the strike posted an open shop notice and published it generally.

At Other Points.

A conference between representatives of steel foundries in Belleville, East St. Louis and Granite City, Ill., and a molders' committee was held recently, and an agreement was reached by which the molders will receive an advance of 25 cents a day, or about half the amount for which they asked.

Of the 11 foundries in Grand Rapids, Mich., four have been operated as open shops for some years. The remaining seven adopted this policy when the demands of the molders were made on May 1. New men are being broken in to take the places of strikes and a number of the shops are operated at about half capacity. The seven firms which have recently signed an open shop announcement are Dutterworth & Lowe, Incorporated; the Haney School Furniture Company, Rempis & Gallmeyer Foundry Company, Henry J. Hartman, Grand Rapids Foundry Company, Adolph Leitelt Iron Works, and Clemens Huxoll, proprietor of the Vulcan Iron Works.

The contractors for the East River tunnels for the Pennsylvania-Long Island Railroad have encountered so much trouble with "blow-outs," as a result of boring but a slight depth under the bed of the river that it is reported that experiments are to be made in freezing the river bed. The air pressure in the tunnels is too great for the overlying earth to withstand in its natural condition. In the opinion of some engineers the tunnels may have to be relocated at a greater depth. The so-called Belmont tunnel, at Forty-second street, is being bored much deeper and thus far its contractors have had no trouble.

At Toledo, Ohio, on June 12, five bridge companies and five agents who were recently indicted for the violation of the Valentine anti-trust law were found guilty and fined $500 each. The concerns involved were the Canton, Massillon, King, Bellefontaine and Mount Vernon bridge companies.

OBITUARY.

PETER M. HITCHCOCK, aged 69, prominent for many years in Cleveland, Ohio, business circles, died suddenly of heart disease on June 9. He had long been identified with iron and coal interests in northern Ohio. In 1858 he undertook blast furnace work at Ironton, Ohio, and followed similar employment later at Youngstown. He served three years with the Army of the Tennessee, and in 1865 went to Cleveland, becoming a partner in the firm of Cleveland, Brown & Co., dealers in iron and steel. He was the senior partner when the business was sold in 1888 to what is now Bassett, Presley & Co. For a number of years Mr. Hitchcock was engaged in coal mining. He organized in 1890 the Moon Run Coal Company, which was absorbed by the Pittsburgh Coal Company. In 1905 he organized the Lincoln Electric Mfg. Company of Cleveland, and was its president and manager, two sons being also connected with the company. He was a director of the G. C. Kuhlman Car Company, the Cleveland Electric Railway Company, and of two important banks.

WALTER M. JEFFERY, auditor of the Oliver Iron Mining Company and the Pittsburgh Steamship Company, died at Duluth, Minn., May 26, from a stroke of paralysis. He was 34 years old. He had a clerical position at the Queen mines, Negaunee, Mich., some years ago, under Thomas F. Cole, now president of the Oliver Company. On the formation of the Oliver Iron Mining Company Mr. Jeffery became chief clerk in the Milwaukee office and was promoted rapidly.

JOHN C. NULSEN, president of the Missouri Malleable Iron Company, East St. Louis, Mo., died June 2, aged 82 years. He was born in Göttingen, Hanover, Germany, and came to the United States in 1842. In 1881 he became a stockholder in the Missouri Malleable Iron Company and later assumed the management of the company. He removed the plant from St. Louis to East St. Louis, Ill., in 1892, and much larger operations were then undertaken. Mr. Nulsen leaves nine children. One son, F. E. Nulsen, is secretary and general manager of the Missouri Malleable Iron Company, and A. J. Nulsen is treasurer.

GEORGE B. BUCKINGHAM, owner of the Arcade Malleable Iron Company and the Worcester Malleable Iron Company, Worcester, Mass., died suddenly June 7, aged 58 years. He was a native of Oxford, Conn., and went to Worcester when 20 years of age to enter the employ of the Sargent Card Clothing Company. In 1873 he became associated with his father-in-law, Warren McFarland, in the malleable iron business, and in 1880 the business came under his sole direction, owing to the advanced age of Mr. McFarland. Mr. Buckingham was one of the prominent Masons of Massachusetts and had held many offices of trust and honor in the several Masonic bodies. He was a member of the New England Foundrymen's Association and was its president in 1900-'01, having been promoted from the vice-presidency. He was the first vice-president of the American Foundrymen's Association in 1902. He was vice-president of the Worcester County Foundrymen's Association during the existence of that organization. He was a member of the Worcester Club, the Tatassit Canoe Club and the Frohsinn Society of Worcester and of the Ancient and Honorable Artillery Company of Boston. For 15 years he was director of the Citizens' National Bank of Worcester. He leaves a widow, two daughters and a son.

The lumber industries of this country have now reached a point when they must turn their attention to Southern and Pacific states for the future supply of timber. In a recent report of the *Census Bulletin*, the estimated quantity of merchantable timber on lands owned by lumbermen was 215,000,000,000 feet; of this amount 62,000,000,000 feet are found in the Southern group of states, while the states of California, Oregon and Washington are estimated to have 78,000,000,000 feet. It is worthy of note in this connection, that while the general average for the entire country of merchantable timber per acre is 6709 feet, the average for the Pacific States is 24,500 feet, an indication of the size of the gigantic redwood trees for which that part of the country is justly famous.

PERSONAL.

John Y. Brooks has become superintendent of the Ensley, Ala., plant of the Southern Steel Company, formerly the Alabama Steel & Wire Company. Mr. Brooks has been connected with the Colorado Fuel & Iron Company for some time and previously was superintendent of the Joliet mill of the American Steel & Wire Company.

The first honorary degree of Doctor of Laws ever granted by Lehigh University, at South Bethlehem, Pa., has been just conferred upon Dr. R. W. Raymond of New York, the secretary of the American Institute of Mining Engineers. The honorary degree of Ph. D. was conferred upon him in 1870 by Lafayette College. He has in the past delivered a number of addresses before Lehigh University and was a stanch friend of the institution during its days of adversity.

At a meeting of the Council of the American Society of Mechanical Engineers, held June 6, it was unanimously decided to invite Calvin W. Rice, at present a consulting engineer of the General Electric Company, in New York City, to become secretary of the society. The position will be made vacant next December, at which time the resignation of Prof. F. R. Hutton, announced in a previous issue, will take effect. Mr. Rice has been a very active member of the society and is now chairman of the Committee on Papers. While he still has the offer under consideration and has not yet positively accepted it, it is confidently believed that he has the society's welfare so much at heart that he will be willing to make the sacrifices necessary if he devotes himself to this new work.

John L. Mullin has been appointed auditor of the Oliver Iron Mining Company and the Pittsburgh Steamship Company, succeeding the late Walter M. Jeffery.

Lewis H. Morgan, general manager of the Ridgway Machine Tool Company, Ridgway, Pa., has gone to Europe.

Donald Tulloch has been elected secretary of the Labor Bureau manitained by the metal trades of Worcester, Mass.

Thomas Mitchell, who has been connected with steel foundries for the past 20 years, has been appointed to succeed J. Turner Moore as superintendent of the Chester, Pa., plant of the American Steel Foundries. Charles Lidstone has been made assistant superintendent to succeed Mr. Mitchell. Mr. Lidstone has been connected with the Chester plant for 15 years.

W. D. Sargent, formerly president of the American Brake Shoe & Foundry Company and later vice-president of the American Steel Foundries, has become president of the newly organized Reading Steel Casting Company, Reading, Pa., with offices at 114 Liberty street, New York. J. Turner Moore, heretofore superintendent of the Chester, Pa., plant of the American Steel Foundries, has become vice-president and general manager of the Reading Company.

Hollinshead N. Taylor of the N. & G. Taylor Company, Philadelphia, and vice-president of the Maryland Sheet & Steel Company, sailed on the Amerika on June 7 for an extended trip abroad.

William Guggenheim and Irwin C. Stump were elected directors of the International Steam Pump Company, to succeed H. K. Knapp and Jacob Rubino at the annual meeting of stockholders, held on Tuesday.

Albert Ladd Colby sails for Europe on Tuesday, June 19. After a business trip he will attend the meeting of the Iron and Steel Institute at London, at which he will present papers on rail specifications and on the nodulizing of fine iron ores.

Muffling tanks to minimize the noise of the escape of exhaust steam from high pressure steam engines are sometimes needed. In such cases it suffices to insert near the engine a chamber of 15 or 20 times the volume of the cylinder and continue the exhaust pipe from this chamber. This will do away with the disturbance caused by steam passing through a tortuous exhaust pipe.

The Machinery Trade.

NEW YORK, June 13, 1906.

The very heavy demand for all classes of machinery received further impetus the past week by the receipt by merchants of another extensive railroad list of tools and a large number of smaller inquiries and orders. Business in this section is getting greater and greater and at this time the demand for machine tools at least can be said to be enormous, the only limit to sales being the ability to get reasonable deliveries. The most conspicuous features of the market are the large railroad lists before the trade, which were further augmented the past week by the large list sent out by the New York, New Haven & Hartford Railroad and additional specifications issued by the Pennsylvania Railroad. Although these lists cover tools valued at several hundred thousand dollars, they are not by any means a major portion of either the inquiries or orders now on hand. Several instances came to light the past week of orders lost by dealers because they could not guarantee deliveries before two or three months, and purchases from floor are getting to be a rarity, dealers having hard work to keep sample machines in stock.

As the present activity in the machinery trade is a continuance of that of the past few months, it is but natural that the month of May was one of the best in many years. With many the month was undoubtedly a record breaker. One of the large companies reports sales of one class of machines for the month amounting to $50,000, which figure has never but once been excelled in the company's existence.

Pennsylvania Railroad Machinery Requirements.

The purchasing agent of the Pennsylvania Railroad Company is asking for quotations for tools and machinery for the Pennsylvania Railroad division, the United Railroad of New Jersey division and the Philadelphia, Baltimore & Washington Railroad. The list is a fairly large one, and many of the tool and machinery trade have already received a copy of the specifications, as they have been sent out from day to day during the past two weeks. This is the first and entire list, however, which has been published:

One vertical three-spindle car boring machine, one turret lathe, 1 x 10 inch; one toolroom lathe, 18-inch swing over ways; one hand plate bending rolls, one pipe cutter for cutting pipe from 4 to 6 inches, two pipe cutters for cutting pipe from 2 to 3 inches, two pipe cutters for cutting pipe from 1 to 2 inches, one automatic taper screw machine for special work, two 1500-pound single frame steam hammers, two single head axle lathes for turning main driving axles, one 24-inch power forcing press, having a capacity of 15 tons; one milling machine, with vertical head and gear cutting attachment; four 250-pound post hammers, two 600-pound single frame steam hammers for smith work, one No. 5 25-inch throat, three-gag, punch and shear, capable of punching 2¼-inch holes through 3¼-inch plate; one No. 3 punching machine, belt driven; one simple noncondensing, automatic, self contained, center crank engine, developing 100 horse-power when supplied with steam at 100 pounds pressure; one engine, same as above, with the exception that it shall be side crank, and the support for the outboard bearing shall be rigidly connected to the main bed plate of the engine; two No. 1 plain milling machines, one vertical hydrostatic driving box shell and rod press, motor driven; one 6000-pound double frame steam hammer, one oil furnace for welding flues or any other furnace used for this purpose; one No. 6 120-inch gap shears, one No. 5 punching machine, having a 20-inch throat, and provided with a jib crane, motor driven; four No. 12 power hammers, two 26-inch plain rotary planing machines, having a 3 x 6 foot table; one rapid action bar punch, capable of punching ½-inch hole in 3-16 inch bar; one combined ring and circular shears, two 1½-inch double head bolt cutters, belt driven; one hollow chisel mortiser, belt driven; one No. 2 angle iron shears, for shearing angles up to about 5½ x 6½ x ⅝ inch, to be belt driven; two horizontal duplex milling machines, having a carriage about 20 inches wide by 6 feet long, motor driven; one single head, 90-inch driving wheel lathe equipped for turning driving wheel journals, motor driven; five No. 1 special punching machines, provided with three-gag arrangement, having 20-inch throat and capable of punching ⅞-inch holes in ¾-inch plate; two plain milling machines, capable of feeding 42 inches long, 16 feet across by 20-inch vertical, machines to be belt driven; four 1½-inch four-spindle bolt cutters, machines to be belt driven; three 1½-inch single head bolt cutters, to be belt driven; two six-spindle vertical nut tapping machines, belt driven; two ten-spindle rotary nut tappers, belt driven; three 48-inch hydrostatic car wheel presses of 300 tons capacity, machines to be belt driven; two 42-inch 300-ton hydrostatic car wheel presses, belt driven; one forcing press for tin shop work, two 90-inch driving wheel lathes, motor driven; two driving wheel lathes, to turn locomotive tires, 68 inches over tread; one water pipe tapping machine, five gap lathes for truing up journals on axles having car wheels on them, machines must have at least 45-inch swing and should be belt driven; one hydraulic spring testing machine, two straight and taper bolt turning machines, belt driven; two 2000-pound single frame steam hammers, cylinders 13 x 33 inch; two 20-ton steam locomotive cranes, four 10-ton steam locomotive cranes, one hydraulic stake riveter, having 17-foot gap and 6-inch stroke; three portable pneumatic riveters, to be capable of driving ⅞-inch rivets with 80 pounds pressure of air per square inch; three vertical centering machines, to center stock from ½ inch to 4 inches in diameter, 3 feet long; two two-spindle centering machines to take stock up to 6 inches in diameter, one cross head guide grinder for surfacing locomotive cross head guides, one band scroll and resaw to resaw stock 9 inches thick by 24 inches wide, one four-sided timber planer to plane timbers 16 inches thick and 30 inches wide, one automatic car gainer, with 25-inch cross travel and 21-inch vertical travel, combined with a six-spindle car boring machine with two vertical adjustment spindles for angular boring; one combined punch and shear, with 15-inch throat and 15-inch shear blade; two vertical adjustment universal spindles, one No. 4 universal cold saw cutting off machine, motor driven; one No. 5 self feeding rip saw, two No. 7 portable forges, one No. 1 plate splitting and cross cutting shear, with steel bed, top gear, motor driven; one steel tired car wheel lathe, 42-inch swing over ways; one screw cutting lathe, 14-inch swing over ways; one metal working lathe, 20-inch swing over ways; one universal radial drill; one No. 2 combination cold saw cutting off machine, having a 24 x 7 foot table; one 1-ton capacity portable electric hoist; one hand power traveling crane, with electric hoist of 1-ton capacity; four high speed engines, to operate and be direct connected to some standard type 225-250-volt direct current engine type generators of 50-kw. capacity; three 2 horse-power portable motors, mounted on trucks; one 200-kw. compound wound direct current generator, two storage battery electric locomotives; one 100-kw. synchronous motor generator set, motor to be arranged for 220 volts, two phase, 60 cycles, alternating current; 12 No. 23 Prentiss bench vises, four 50-kw. engine type generators, one high speed simple side crank engine, one ten-spindle drill press for drilling air brake pins; two patent band sawing machines, having a table 34 x 40 inches; two air compressors, having a capacity of about 1000 cubic feet of free air per minute each; two No. 4 automatic screw machines, two automatic nut tapping and facing machines; one special automatic L. B. machine, with magazine attachment and all tools for flexible staybolts; two No. 7½ feed water heaters; five to eight 10 x 6 x 10 inch outside end packed plunger pumps, pumps to be brass fitted and good for 300 pounds working pressure; one 2000-pound chain hoist, to have about 10-foot lift; five electric traveling hoists, having a capacity of 1 ton and a lift of 15 feet; four compound steam two-stage air compressors, having a capacity of from 500 to 600 cubic feet of free air per minute and capable of delivering air at 120 pounds pressure when operating with 100 pounds steam pressure; one solid frame patent universal wood worker, No. 63; one horizontal No. 3 cut off saw, belt driven; one No. 5 vertical automatic cut off saw and gainer, belt driven; three pipe cutting and threading machines, to take pipe from ¼ to 1¼ inches.

Other Railroad Lists.

The long looked for list of machine tools which is to be purchased by the New York, New Haven & Hartford Railroad was received by the trade on Monday and machinery merchants are now preparing their bids. These specifications cover a large amount of machinery, a great deal of which is specified, and it is generally understood that the company has about decided on the make of at least the major portion of the machinery it will purchase. This machinery is intended for equipping the new shops at Readville, Mass., which are being constructed at a cost of about $1,200,000.

Important orders in the power machinery line were placed this week by the New York Central Railroad for carrying out its scheme of electrifying the road adjacent to the Grand Central Station. We understand that orders have not yet been placed for the power equipment for the 20,000 horse-power plant which is to be installed in the new station on Forty-second street. The list of machine tools which is in course of preparation will probably be sent out shortly.

The Baltimore & Ohio Railroad sent out inquiries the past week for a few machines.

The Erie Railroad has placed contract with Westinghouse, Church, Kerr & Co., New York, for the electrification of the Rochester division between Mt. Morris and Rochester, N. Y. The contract for the division from Avon to Corning will shortly be placed.

Another New Steel Car Plant.

Equipment is being purchased now for an extensive addition which is to be made to the plant of the Middleton Car Works, Middleton, Pa. The company makes a specialty of freight and shop cars and is now going into the manufacturing of steel freight cars on an extensive scale. Plans for the new steel car plant are in the hands of J. B. Taylor,

56 Pine street, New York. It is proposed to equip a plant capable of turning out from 12 to 15 cars a day at first and the main building or car shop will be 70 x 400 feet. There will also be a press shop about 70 x 200 feet and the steel yard will be equipped with large traveling cranes for yard service. There is no power equipment to be bought, as the company has an extensive power plant and in addition purchases electric power from another company. The equipment will include some heavy tools, presses, furnaces and everything that goes to make up a well ordered first-class steel car plant. It is the purpose of the company to proceed with the construction operations as rapidly as possible and it is expected that the plant will be thoroughly equipped and in working order before fall sets in.

The building of the above described plant is but another instance of the rapid growth of the steel car industry in this country, and the trade, which has already reaped considerable benefit from this source, will no doubt learn of other similar projects. Some people in the trade have long been watching the Pullman interests in the expectation of hearing of their going into the manufacture of steel cars and rumors to that effect have been current from time to time. As yet, however, there has been no positive announcement from the officials that the Pullman Company will make steel cars, although several of its competitors have gone into that line. In that connection it might be stated that the large plant of the Dominion Steel Car Company at Montreal, which resulted in considerable trade to New York and Chicago machinery men, is now being equipped and will shortly be in working order. There is still some buying to be done, it is understood, and it is said in the trade that the orders for the power apparatus have not been completed as yet.

Some time ago the Dickson Car Wheel Company, Houston, Texas, secured a new location of 9 acres with the intention of erecting thereon a car wheel foundry. The company has completed plans for a new building of fireproof construction throughout which will be 150 x 322 feet. Bids will shortly be asked for the construction of the building and also on the machinery for equipping the new foundry. The recent fire at the company's plant only destroyed part of the building and no damage was sustained to the equipment or power plant. The damaged building, which was the car wheel foundry, has been replaced and that department is now running with the usual force.

The Zucker & Levett & Loeb Company, 250 Tenth avenue, New York, is in the market for quite a little new machinery, including such machine tools as drill presses, pressing machines, stamping machines, &c., for completing the equipment of its new plant. The company desires to purchase the tools as quickly as possible, as it needs the machinery to replace that lost in the recent fire which destroyed its factory. A large new factory building, extending from 516 to 524 West Twenty-fifth street, adjoining its old premises, has been taken by the company and it will have its works equipped so that it can deliver goods the first of next week. With this new factory the company will have much larger facilities than before for the manufacture of nickel plating outfits, low voltage dynamos, polishing machinery and material, in fact everything required for plating and polishing.

The Petroleum Iron Works Company, whose plant is now located at Washington, Pa., has decided to remove to Sharon, Pa. The main building at the new plant will be 100 x 600 feet and there will be a number of smaller buildings. The buildings will be steel structures and electricity will be used for power. The company will need a large amount of ironworking machinery, such as lathes, planers, drills, presses, &c., and the new plant will be much larger in size than the present one. As soon as the new buildings at Sharon are ready the equipment at Washington will be removed to that place. The company manufactures tank cars, tanks, boilers, riveted pipe, and oil well and railroad supplies.

Westinghouse Company's Proposed Foundry.

The Westinghouse Consolidated Foundries Company of Pittsburgh has been organized and will take over the three foundries of the Westinghouse Electric & Mfg. Company now located in Cleveland, Ohio, and at Allegheny and Trafford City, Pa. The new company has acquired 20 acres of land in Trafford City which will be used for the erection of buildings to accommodate the Cleveland and Allegheny foundries, which are to be removed to Trafford City as soon as practicable. It stated that seven buildings will be erected with a total floor space of 840,000 square feet and that a large amount of foundry equipment will be needed. It is the intention of the Westinghouse Company to centralize its foundry interest at Trafford City, which will economize the manufacture of castings used by the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company.

A new foundry doubling the capacity of its present plant is to be erected at Midland, Pa., by the S. Jarvis Adams Company, Pittsburgh. It is intended to have this foundry completed by the latter part of the year and plans are now being prepared. When these are finished, probably within the next two months, the company will take up the matter of equipment.

A new plant will shortly be constructed at Plainfield, N. J., for the Vacuum Cleaner Company, 427 Fifth avenue, New York. The company proposes to manufacture its wagons, vacuum pumps and other carpet and rug cleaning machinery. Dodge & Morrison, 82 Wall street, are the architects for the proposed plant and they will also have charge of the engineering details. The plant will consist of a main factory building of mill construction, 60 x 170 feet, two stories in height. The main building will contain a machine shop, general assembly department, paint and wood working department, etc. There will be a brass foundry, 20 x 50 feet; power house, 42 x 42 feet; pattern building 15 x 20 feet, and pattern storage building, 15 x 20 feet. The machinery details have not been worked out as yet, with the exception that it has been decided to install about 200 horse-power of boilers and most of the machinery equipment of the plant will be electrically operated. Besides purchasing a complete brass foundry equipment the company will require a rather general assortment of machine tools and some woodworking equipment. These details are all in the hands of Dodge & Morrison, who will also let the contract for the construction of the building. It is proposed to give out that work very shortly and the plant will be built as soon as possible. The company has a desirable location adjacent to the tracks of the Central Railroad of New Jersey and arrangements will be made to construct a spur from the main line into the company's property and through the erecting yard, in which will be built an erecting platform, in order to facilitate the shipping of the firm's product. The company has purchased considerable property to allow for enlarging its plant when there is necessity for it.

The Canaan Coal Company is opening up a coal mine on its recently acquired property in Canaan township, Athens County, Ohio. The coal is the Hocking vein and is from 6 to 9 feet in thickness. The tract consists of 6000 acres and is crossed about midway by the Hocking River and the Baltimore & Ohio Southwestern Railroad in the river valley, with Canaanville as the railroad station. One mine is now being put down and the air shaft is completed. The depth of the coal is about 400 feet from the surface. It is the intention to equip this mine with a steel tipple and the very best machinery and equipment obtainable for mining, hoisting and preparing the coal. A coal washer will be erected. It is the intention that everything shall be in keeping with the size and importance of the property. This is the most southerly extension of the Hocking coal yet developed and is proving to be as fine a development as has yet been found.

The company is an incorporation under the laws of Ohio and the ownership lies in some Jackson, Ohio, gentlemen who have heretofore been interested only in the manufacture of iron, namely, John E. Jones of the Globe Iron Company and Charles O. Brown and Lewis V. Brown of the Star Furnace Company. Lewis V. Brown is the general manager of the coal company. The office of the company for the present is at Jackson, Ohio, but soon will be moved to Canaanville. The plans and specifications for the equipment and machinery have not yet been prepared, but that question is being taken up and will be settled as soon as possible, and then contracts will be let for the outfit desired.

Power Projects.

Within the next few days the New York, Westchester & Boston Railway Company, 30 Broad street, will decide whether it will let out the work for its proposed power plant as a blanket contract or award the contracts to various bidders. W. A. Pratt, chief engineer of the company, stated Tuesday that the matter would be settled within the week and he declared that it was probable that the whole work would be given to one party, although the matter has not been decisively settled as yet. The power house will be of about 15,000 kw. capacity. The list of the power requirements include 24 water tube boilers, one 60 ton electric traveling crane, 6 horizontal boilers, feed pumps, three steam-turbo alternators and other equipment, and it is probable that whoever gets the contract, provided it is awarded in blanket form, there will be some business for the trade in minor equipment. The company is now getting bids for equipment for its substations, of which there will be either six or seven. Bids are being asked on forty-five 550 kw. transformers and thirteen 15,000 kw. converters as well as other equipment for the stations. The company has not as yet prepared its plans for its machine shop and no equipment has been bought for that as yet. It is probable that that part of the work will not come to a head until fall and it is said that the buying at least will be deferred until then. This is true also of the proposed repair plant, which will be a rather extensive one, as it is calculated to take care of the company's entire car equipment through that plant. The company is building about 105 miles of track throughout Westchester County

and the work of construction is well under way. The system will be a four track third rail electric road and as none of it will be at grade the construction work is no small undertaking. The City & County Contracting Company, which also has offices at 30 Broad street, is doing all the buying for the company and the inquiries are all being placed in this city through the latter corporation, which is closely allied to the railway company.

A good sized amount of power equipment will soon be required by the Northern Electric Street Railway Company, Scranton, Pa., which is having plans prepared for an alternating current power station to be located near Dalton, Pa., to cost $85,000. No particulars are available at the present time.

A general contract will shortly be let for the construction and equipment of an 11-story addition to the leather belting plant of Charles A. Schieren & Co., at 37 Ferry street. The building will be so constructed as to allow for 7500 square feet of available working space on each floor, and it will be a steel skeleton structure, with brick front and concrete fireproofing. A sprinkler system will be installed, and there will be two electric elevators. The firm will furnish its own light and power, and will make an extension to its power plant for that purpose. The addition will consist of two 200 horse-power boilers and one 150-kw. generating set, making the third set in the plant, with a total capacity of 250 kw. The building will have an entrance through a court opening on Beekman and Cliff streets. The firm will occupy some of the new floors in the addition and the rest will be rented. W. S. Timmis, with offices at 150 Nassau street, is the consulting mechanical engineer, and Radcliffe & Kelly, 3 West Twenty-ninth street, are the architects.

Wm. F. Burditt, Jr., has opened an office at 136 Liberty street, New York, as an expert specialist dealer in bar, plate and sheet metal working machinery, representing only those manufacturers who are themselves specialists, devoted to the manufacture of some particular line of tools in which they excel.

Chicago Machinery Market.

CHICAGO, ILL., June 12, 1906.

Large orders have been placed in this market during the week, the most important one being for the second installment of equipment for the West Allis shops of the Allis-Chalmers Company. From the new buildings now under way and contemplated in this section it is apparent that the heavy demand for machine tools will continue. One of the large projects under way, the new shops at Indianapolis, Ind., for the Big Four Railroad, is progressing, and it is reported that plans for the buildings are nearly completed. Machinery merchants are expecting large orders for machinery for equipping these shops, as they will be of large proportions.

The Independent Pneumatic Tool Company, Chicago, announces that it will have a complete working exhibit of Thor pneumatic tools and appliances at the Railroad Master Mechanics' and Master Car Builders' convention at Atlantic City June 13 to 20. The following is a list of the tools that will be shown in the exhibit: Piston air drills and reamers, pneumatic reversible flue rolling, tapping and wood boring machines, pneumatic one-piece long stroke riveting hammers, pneumatic chipping, calking and beading hammers, and pneumatic wood saws and grinding machines. The company will be represented at the convention by James B. Brady, W. O. Jacquette, John B. Hurley, Frank A. Barbey, R. S. Cooper, R. D. Hurley, Charles Parsons, J. P. Bourke and George A. Gallinger.

Allis-Chalmers Machine Tool Orders.

The second heavy installment of orders for new machine tool equipment has been placed by the Allis-Chalmers Company, Milwaukee, for installation in the new machine shop, units Nos. 4, 5 and 6, which are rapidly nearing completion. The first order for equipment, placed some months ago, covered the heavier machine tools of various kinds used in the manufacture of steam turbines, gas engines and large electrical units, while the order just placed consists largely of machinery of smaller size and weight. The aggregate cost of the recent purchase is $265,000. This order covered among other things an equipment of 109 separate machine tools of various kinds for shop No. 5 and 85 tools for shop No. 4, where steam turbines and heavy electrical machinery will be built. More than 130 Allis-Chalmers electric motors have been ordered to be built at the Bullock Electrical Works, Cincinnati, and shipped direct to the various machine tool makers who are to furnish equipment, who will mount them for direct drive upon the tools which are to be shipped to Milwaukee ready for installation. These motors will range in horse-power from 1 to 35. The following tool makers will furnish the new equipment: Lutter & Gies, Milwaukee; Kearney & Tracker, Milwaukee; O. L. Packard Machinery Company, Milwaukee; Gisholt Machine Company, Madison, Wis.; Ransom Mfg. Company, Oshkosh, Wis.; Toledo Machine & Tool Company, Toledo, Ohio; Niagara Machine Tool Works, Buffalo, N. Y.; Greaves, Clusman & Co., Cincinnati, Ohio; Chas. E. Wright Company, New Orange, N. J.; Acme Machinery Company, Cleveland, Ohio; Pratt & Whitney Company, Hartford, Conn.; Hamilton Machine Tool Company, Hamilton, Ohio; Bullard Machine Tool Company, Bridgeport, Conn.; Prentiss Bros. Company, Worcester, Mass.; J. D. Blount Company, Everett, Mass.; Warner & Swasey Company, Cleveland, Ohio; Garvin Machine Company, New York; Schumacher & Boye, Cincinnati, Ohio; Baush Machinery Company, Springfield, Mass.; Stoever Foundry & Mfg. Company, Myerstown, Pa.; Newton Machine Tool Company, Philadelphia, Pa.; Bickford Machine Tool Company, Cincinnati, Ohio; Pittsburgh Machine Tool Company, Allegheny, Pa.; W. F. & John Barnes Company, Rockford, Ill. Two new standard Colliau cupolas will be furnished by the J. D. Smith Foundry & Supply Company, Cleveland, for the foundry addition. These furnaces will have a diameter of shell of 91 inches and a hight of 60 feet over all. Contracts have also been let for digging two additional artesian wells at the West Allis Works, which will augment the present supply used for all purposes. The wells will be driven to a depth of approximately 1000 feet. One of the old 36-inch wells will also be deepened to approximately 125 feet. W. H. Gray & Bros., Milwaukee, are the contractors for the work.

The L. Covel Mfg. Company, manufacturer of saw sharpening machinery, 8 South Canal street, Chicago, is having plans prepared for a new plant at Benton Harbor, Mich. Preliminary plans call for the erection of a foundry, 60 x 175 feet; machine shop, 50 x 250 feet, two stories; powerhouse and storehouse. Some of the equipment has already been ordered through local dealers for the machine shop, including a Hamilton planer, a Lodge & Shipley lathe, a gang radial drill and a Gould & Eberhardt automatic gear cutter. None of the foundry equipment nor power units have yet been bought, and there will also be required drill presses and a number of smaller tools for the machine shop. As the buildings are completed at the new plant orders will gradually be transferred from Chicago for execution and the local factory will finally be abandoned. The business of the company has grown to such proportions that increased facilities are necessary, and for various reasons removal from Chicago was considered advisable. Employment will be given in the Benton Harbor plant to between 200 and 300 men. The officers of the company are: L. L. Filstrup, president; J. H. Swek, vice-president, and A. W. Filstrup, secretary.

The Moran Boiler Company, Hopkins, Minn., has commenced work on a new boiler plant, the main building of which will be 36 x 100 feet, constructed of concrete blocks. The principal output will be the Moran patent heating boiler, a steel boiler for heating purposes. The company is now in the market for a general line of boiler makers' tools, power and hand; air compressor, 16 to 20 horse-power gasoline engine, punch and shears, bending rolls, &c. No objection will be raised to second-hand tools if in good condition. It is planned to have the plant ready for occupancy by the first of August. Officers of the company are: Frederick Souba, president; Wm. Moran, vice-president and superintendent; J. E. Eckstrom, secretary and manager; F. E. Dix, treasurer.

The Crescent Company, Valparaiso, Ind., is in the market for a 15-inch engine lathe and a saw table.

The Union Fibre Company, Winona, Minn., is having plans prepared for two large reinforced concrete buildings to augment its factory capacity. A number of special machines required in the business have already been purchased and orders will be placed for the balance in the near future. The company is in the market for 12 to 15 motors of from 5 to 75 horse-power capacity. The plant will be operated by electricity, current being purchased from the local power company.

C. B. Allen, Johnson City, Tenn., with a number of associates, is interested in the erection of a $50,000 wood working plant. An 8½-acre site has been purchased for a plant and a full equipment of wood working machinery is required, as well as 250 horse-power in boilers and 200 horse-power in engines.

The Reo Motor Car Company, Lansing, Mich., is about to break ground for two buildings, 65 x 500 feet each and two stories high. These additions will materially increase the capacity of the present plant. Two new boilers of 100 horse-power each will be required, as well as one 250 horse-power Corliss engine.

Kearney & Trecker, manufacturers of milling machinery, at 59th and National avenues, West Allis, Wis., have incorporated their business under the name of the Kearney & Trecker Mfg. Company. The capital stock is $100,000, fully paid in, all of which is owned by Edward J. Kearney and Theodore Trecker, who have heretofore conducted the business as a partnership. The company owns a modern plant and is doing a large business in the manufacture of milling machines.

J. M. Dickinson has opened an office at 40 Dearborn street, Chicago, and will act as Chicago representative for Franklin Williams, 41 Cortlandt street, New York; the Wm. Powell Company, manufacturer of engine and boiler room

specialties, Cincinnati, Ohio, and the Materne Mfg. Company, engineer and contractor for all kinds of pipe work, St. Louis, Mo.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 12, 1906.

There has been a noticeable absence of orders for tools and general machinery during the past week. This condition seems to affect the trade yearly about this time, and while as a rule it is considered of no great importance in sizing up future conditions, even less attention appears to be given it this year than in the previous ones. General business conditions, which on the whole are quite satisfactory, are probably one of the reasons for this. At the same time manufacturers have their order books well filled and have nothing to worry about for the near future at least. Some early business covering extensive purchases is also practically assured, while the outlook for a good general run of trade in the near future is particularly bright.

The extensive list of tools required for replacement and extension by the Baldwin Locomotive Works, mention of which has been previously made in these columns, has not been closed at this writing. This matter is taking a large share of the trade's attention and continues to be the leading feature of the market. It is now said by the Baldwin representatives that it is hoped they will be able to let contracts covering the major portions of their specifications before the end of the present week. The matter of delayed deliveries is understood to have been a great handicap in the closing of this order. The company is anxious to have prompt shipment of the tools purchased, which in most cases manufacturers cannot meet without further delaying deliveries already promised other customers.

Manufacturers' capacities continue well taken; the short respite in new business may help some on future deliveries, but as most plants have all they can do for months ahead, it will be some time before any material improvement in deliveries can be looked forward to. With the present facilities of tool builders little betterment can be anticipated, unless business falls off flatly during the summer months, and that is scarcely expected to be likely.

The foreign demand for special tools is somewhat improved. Sales of crank shaft lathes, cold sawing machines and other special tools are being made in fairly good quantity, but the demand for standard lines of machine tools continues inactive. Exportation of power transmission specialties has increased recently, and a very satisfactory foreign trade is being done by manufacturers of these lines.

Boilers and engines continue in fairly good demand, although no sales of those of the higher powers have been reported during the past week. Second-hand machinery and tools are being well sold, but purchasers have the market pretty well cleared of desirable tools of the higher class. Second-hand boilers and engines, particularly of the medium powers, have been subject to good inquiry, although sales have not been very extensive.

The demand for castings, both gray iron and steel, continues very good. Gray iron foundries are in full operation, their capacities in most cases being fully taken. There is some feeling of unrest on the part of the molders in some of the jobbing foundries, but as the founders have had the matter well in hand heretofore no difficulty is anticipated. Steel casting plants continue record tonnage operations, and all are employed at their full capacity.

The American Pulley Company will build an addition, 50 x 180 feet, one story high, to its plant at Twenty-ninth and Bristol streets. This building will be used for general manufacturing purposes and for assembling pulleys. The increased facilities will also enable the company to further increase the size of pulleys now being made. Most of the equipment for the addition is of a special design and has already been provded for.

Preliminary plans for the construction of the North Broad Street Subway, in this city, have been filed with the Board of Highway Supervisors by the Philadelphia Rapid Transit Company. These plans provide for a two-track road from Walnut street to Olney avenue, near the city line, a distance of over 5 miles. Several weeks will be required to go over the plans. Arrangements for the beginning of the work of building this portion of the subway system in this city will be started as soon as the preliminary plans are approved by the Board of Supervisors.

The Standard Pressed Steel Company, manufacturer of the American Pioneer pressed steel shaft hanger, states that May was the best month in the history of the business. During that time 26 new agencies for the sale of the hanger were established in the Southern and Middle Western States. There has been an increased demand from abroad, particularly from Australia and China, and very extensive shipments are being made to Austria, Holland, Sweden, Norway, Switzerland, and to Melbourne and Adelaide, Australia. Domestic shipments have also been large, covering deliveries to all sections of the country, a notable shipment comprising 400 large hangers for parties on the Pacific Coast. This company has increased the size of its hanger up to and including those having a drop of 30 inches and taking in a shaft of 4 inches diameter.

The Eynon-Evans Mfg. Company has recently taken orders for a number of large water meters, ranging from 800,000 to 3,000,000 gallons capacity, also for a number of steam jet blowers and for injectors. Every department of the plant is fully occupied and the amount of business on the company's books is larger than ever. A carload of patterns has just been shipped from that department for the Bethlehem Steel Company, while a number of steam jet blowers have been shipped the various steel plants, as has also a large number of injectors. The foundry is particularly busy on a large line of acid resisting bronze castings for mine purposes, as well as a general line of brass and other metal castings.

The Tindel-Morris Company, Eddystone, Pa., has received a number of orders from abroad for its line of Tindel-Albrecht crank shaft lathes, where these tools are meeting with considerable favor. One of the orders recently received was for seven lathes, divided between 12 and 17 inch sizes, for export to Germany. Domestic orders for these tools have also been good, particularly from manufacturers of automobiles. Among recent deliveries made by this company may be mentioned two 17-inch lathes for the Pope-Hartford Company, several for the General Electric Company, Schenectady, N. Y., and three for nearby concerns. Two machines have also been recently shipped for export.

The High Duty Saw & Tool Company, Eddystone, Pa., an underlying company of the Tindel-Morris Company, manufacturing the Tindel high duty saws and Paragon sawing machines, is very busy, a large number of both blades and machines being in course of manufacture for both the foreign and domestic trade. Orders have been received in good number, and shipments of a number of blades have been made recently for installation in the various shops of the Northern Pacific Railroad Company and the Reading shops of the Philadelphia & Reading Railroad Company. A No. 3 Paragon machine and a large I-beam machine have also been shipped for export to European customers.

The Niles-Bement-Pond Company has been appointed exclusive selling agent in this country for the Tindel-Albrecht crank shaft lathe, manufactured by the Tindel-Morris Company, and the Tindel high duty saw blades and Paragon cold saw cutting off machines, manufactured by the High Duty Saw & Tool Company.

The Energy Elevator Company notes an increased volume of business from both local and out of the city customers. There has also been an increased foreign demand and a number of house lifts have been exported to parties in Belgium. While the principal demand has been for elevators of the hand-power freight type, orders have also been received for electric freight and power freight lifts. A large one of the former is now being installed in the local warehouse of the Dixon Crucible Company.

New England Machinery Market.

WORCESTER, MASS., June 12, 1906.

The feature of the week was the arrival of the long expected list of tools for the new locomotive repair shops of the New York, New Haven & Hartford Railroad, at Readville, Mass., sent out by the company's purchasing agent at New Haven, Conn. The list is a long one, totaling approximately $150,000 worth of machine tools, exclusive of cranes, engines and generators, contracts for which have already been let. Shaw cranes, General Electric generators and three 600 horse-power Hamilton-Corliss engines from the Hoover-Owens-Rentschler Company, Hamilton, Ohio, have been chosen from among the bids. The boiler contract will be let immediately. The company is not giving out its machine tool list for general publication. It has been sent in full to certain large dealers, and piecemeal to other dealers and to manufacturers. It is pretty well understood in the trade that the company's engineers have practically made up their minds what tools are required—that is, what make of tools—this question having been given much attention previous to the sending out of the lists. While there may be some departing from the decisions already made, it is not expected that there will be very material changes in the detailed equipment plans of the engineers. This machinery is to be installed in the new shops, which are to be erected at a cost of $1,200,000, and which will include two main buildings, one a machine, erecting boiler and tank shop, 150 x 900 feet, of steel frame and masonry construction. The blacksmith shop will be 80 x 550 feet, and there will also be erected several auxiliary buildings. Such tools as are in constant use are to be grouped and each group will be driven by a motor. The tools which are used intermittently and require the service of electric cranes are to be equipped with individual motors. The shops are designed to repair from 45 to 50 locomotives a month, and will be located directly across the tracks of the Midland division from the company's other shops.

The Boston & Maine Railroad has applied to the Massa-

chusetts Railroad Commission for the right to issue 42,037 shares of new stock, the proceeds of the sale of which will be used for improvements in the company's system. Of the proceeds of the sale of the stock, which will be put on the market at a figure to be set by the Railroad Commission, $1,000,000 is for the new repair shops to be established at Somerville, in the suburbs of Boston; $5,000,000 for 6000 freight cars and $1,100,000 for new track. The company is already authorized to issue 11,000 shares of new stock in addition to the amount named in the new petition, and it is generally credited among those who are keeping in touch with the plans for the Somerville shops that a part of the proceeds of the 11,000 shares, or some other funds, may be added to the $1,000,000 provided for in the proposed new issue.

It is understood that the Stolwerck Company, manufacturer of chocolate, which has begun the erection of a very large plant at Stamford, Conn., is to equip a large shop for the manufacture of slot machines, in which case considerable machine equipment will be required. The building now under process of construction will be 500 feet long, one half of it 100 feet wide, the other half 200 feet. It is stated that the company's plans call for nine other buildings of the same size.

The managers of the Franklin Fund, the accumulation of a bequest under the will of Benjamin Franklin, with which, together with a generous addition from Andrew Carnegie, a trade school will be established at Boston, patterned on the Cooper Union, New York, have purchased a site for the school at the corner of Berkeley and Appleton streets, in the Back Bay district. The land cost $100,000. It is generally understood that the beginning of work on the building will not be long delayed. Considerable equipment should be required when the building is ready to receive it.

The Narraganset Machine Company, Pawtucket, R. I., manufacturer of sporting goods, is to erect a new building, 60 x 150 feet and one story, as an addition to its locker department.

The American & British Mfg. Company, Providence, R. I., is planning the erection of large additions to its works in that city. The final decision has not been reached, but the present intention is to begin work on the new buildings immediately, in which case a large amount of new equipment will be required, including a number of cranes, one of which will be of large capacity. The changes will be in the nature of a reorganization of the works devoted to the building of the Diesel combustion engine, and in the future to the building of the Wilkinson steam turbine, which the company's engineers are developing, and which is now going through exhaustive tests. The new buildings proper will provide about 70,000 square feet of floor area. There will be a main building and two other structures, which will be continuous to the main building, one of them connecting it with the present works. Some of the heavier tools now in the shops will be moved into the new buildings, but much of the equipment will be new, constituting a long list, it is said. The company occupies the works built by George H. Corliss for the manufacture of the Corliss engine. While they are extensive they do not permit of the best methods of manufacture, viwed from the modern standpoint, and the reorganization, including, as it will, large new buildings, will add greatly to the efficiency of the plant.

The contract has been let for the big boiler shop which will be erected at the Portsmouth Navy Yard at a cost of $134,000, exclusive of cranes.

The Warwick Valve & Faucet Company, Providence, R. I., has been incorporated to manufacture self closing faucets, flushometers, etc. George E. Stillman is the president and treasurer, and James P. Riley the secretary. The office of the company is at 48 Custom House street, Providence.

The Millers Falls Company, Millers Falls, Mass., maker of tools, is to enlarge its foundry by an addition 30 x 50 feet, and will also erect an addition to its shipping room 54 x 71 feet.

Superheated steam in locomotives is said to have been first applied in 1870, on the Chicago, Burlington & Quincy Railroad. The front tube sheet was set back some distance into the boiler and the tubes, projecting through it, formed a superheater in the smoke box. The steam entered the superheater from the dry pipe and passed thence into the cylinders. The device showed some economy, but not enough to offset the cost and the trouble in maintaining it. It was soon abandoned. The system now in such extensive use in Germany was not developed until 1898, when two engines were experimentally equipped with superheating apparatus, which proved to be a decided success.

Government Purchases.

WASHINGTON, D. C., June 12, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 26 for a generating set, blowers, force pumps, blacksmith forges, hydraulic jacks, drilling machine and other supplies for the Eastern navy yards.

A punching and shearing machine is included in the supplies for the Isthmian Canal Commission, circular No. 312, bids for which will be opened June 25.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 24 for the following machine tools for the Puget Sound Navy Yard: Lathes, saws, grinders, drill, planer, shaper, mortiser, bolt cutter, stencil machine and wood worker.

On June 19 bids will be opened at the Bureau of Supplies and Accounts, Washington, D. C., for a valve reseating machine, pneumatic tools, hydraulic jacks, dynamo and other supplies for the Eastern navy yards.

The following bids were opened June 5 for supplies for the navy yards:

Bidder 34, Continental Iron Works, Brooklyn, N. Y.; 41, Chicago Pneumatic Tool Company, New York; 69, General Electric Company, Schenectady, N. Y.; 74, Henshaw-Bulkley Company, San Francisco, Cal.; 76, Handlan-Buck Mfg. Company, St. Louis, Mo.; 85, Holtzer-Cabbott Electric Company, Brookline, Mass.; 86, Harron, Rickard & McCone, San Francisco, Cal.; 87, Ingersoll Milling Machine Company, Rockford, Ill.; 115, Manning, Maxwell & Moore, New York; 116, Montgomery & Co., New York; 126, Niles-Bement-Pond Company, New York; 128, S. Obermayer Company, Cincinnati, Ohio; 135, J. W. Paxson Company, Philadelphia, Pa.; 170, Sherman-Brown-Clements Company, New York; 177, Tabor Mfg. Company, Philadelphia, Pa.; 179, Tilghman Brooksbank Sand Blast Company, Philadelphia, Pa.

Schedule No. 523.

Class 1. One patent lathe head—Bidder 74, $1978; 86, $2747.63; 126, $2299.

Class 2. One power ramming split pattern molding machine—Bidder 177, $565.

Class 3. One gear shaper—Bidder 74, $1805.

Class 4. One horizontal slab milling machine—Bidder 87, $3725; 115, $4000; 126, $5150.

Class 5. One 100-pound helve hammer—Bidder 126, $1000.

Class 6. One die sinking machine—No bids.

Schedule No. 558.

Class 173. Fourteen electric motors—Bidder 69, $4550; 85, $5460.

Schedule No. 559.

Class 194. One sand blast machine—Bidder 41, $225; 76, $355; 115, $390; 116, $385 and $540; 128, $360; 135, $325.50; 170, $389.73; 179, $613.60.

Class 195. Six corrugated steel furnaces—Bidder 34, $1626.

The following bids were opened June 2 for two motor generator sets and appurtenances for the New York Navy Yard:

Crocker-Wheeler Company, Ampere, N. J., item 2, $10,080; time, six months.

Westinghouse Electric & Mfg. Company, Baltimore, Md., item 1, $10,674.

General Electric Company, Schenectady, N. Y., item 1, $11,994; 2, $9994.

Bids were opened on May 26 as follows for two direct connected 8-inch centrifugal pumps for the Portsmouth Navy Yard:

Camden Iron Works, Camden, N. J., item 1, $2580; 2, $2175.

Henry R. Worthington, New York, item 1, $2750.

R. G. Packard Company, New York, item 1, $3424.

J. Edward Ogden, New York, item 1, $2116.20.

Ellicott Machine Company, Baltimore, Md., item 1, $2967.

The Platt Iron Works Company, Dayton, Ohio, item 1, $2250.

D'Olier Engineering Company, Philadelphia, Pa., item 1, $3455; 2, $3096.

Fox Bros. & Co., New York, have been awarded class 7, three water heaters, $1572, for the Isthmian Canal Commission, opening of April 20, circular No. 304.

Under bids opened May 16 for supplies for the Isthmian Canal Commission, item 1, six horizontal tubular boilers, has been awarded to the Phœnix Iron Works Company, Meadville, Pa., $9900.

The following awards have been made for supplies for the navy yards, bids for which were opened May 22:

Chicago Pneumatic Tool Company, New York, class 21, two pneumatic punches, $800.

Niles-Bement-Pond Company, New York, class 23, one Pond back geared engine lathe, with direct connected motor, $2207.

Bullard Machine Tool Company, Bridgeport, Conn., class 34, one Bullard combination turret machine, $1426.

Pratt & Whitney Company, Hartford, Conn., class 36, one Pratt & Whitney die sinking machine, $2600.

Lovekin Pipe Expanding & Flanging Machine Company, Philadelphia, Pa., class 41, one pipe flanging and expanding machine, $4000.

Handlan-Buck Mfg. Company, St. Louis, Mo., class 195, one crane and hoist, $70.

The following awards have been made for supplies for the navy yards, bids for which were opened May 29:

J. B. Kendall, Washington, D. C., class 37, three improved roller tube expanders, $109.

Electric Launch Company, Bayonne, N. J., class 191, two electric motors and a quantity of electrical supplies, $5988.40.

Montgomery & Co., New York, class 197, one portable electric drill, $58.

The following awards have been made for supplies for the Isthmian Canal Commission, under opening of May 21, circular No. 307:

Class 1, item 1, monitor turret lathe No. 2, Fox Bros. & Co., New York, $639.

Class 1, item 2, monitor turret lathe No. 3, Manning, Maxwell & Moore, New York, $1015.75.

Class 1, items 3 and 4, 11 engine lathes, Niles-Bement-Pond Company, New York, $8839.

Class 2, no award. Specifications have been returned to the Isthmus.

Class 4, item 7, two feed water heaters, Alberger Condenser Company, New York, $1900 each.

Class 4, item 8, two feed water heaters, Handlan-Buck Mfg. Company, New York, $1850 each.

Class 7, item 11, four steam pumps, George F. Black Mfg. Company, New York, $165.48 each.

Labor Notes.

Boiler makers and helpers in practically all the boiler shops in Chicago went on strike last week. The strike started when the union objected to an order which had been posted in the shops belonging to the Chicago branch of the National Metal Trades' Association, requiring employees to report at the association employment bureau and register their names and qualifications for work. At the same time the men have demanded an increase in wages from 35 to 50 cents an hour, but this demand is considered a pretext for striking and would be withdrawn if the registration system were waived. According to officers of the Metal Trades' Association, non-union men are rapidly being secured through its employment bureau to take the strikers' places, and it is proposed to establish the open shop in this, the last branch of the metal trades industry in which a union has been able to maintain the closed or all union shop in the plants of members of the Chicago association. The plants against which the men struck are as follows: Allis-Chalmers Company, Wm. Baragwanath, George E. Corbett, Charles Haffner, Hamler Boiler & Tank Company, Herbert Boiler Company, Illinois Steam Boiler Works, Kroeschell Brothers Company, P. McGarry & Son, C. L. McGregor, National Boiler Works, Page Boiler Company, H. Pratt Boiler & Machine Company, Charles Pfeiffer Boiler Company, Sherkey & Peck, Sullivan Boiler & Tank Works, Superior Machine & Boiler Works, Wildman Boiler Company, and Hawley Down Draft Furnace Company. The plant of John Mohr & Sons has been operating on a nonunion basis and is not affected.

Statements made in a recent conference between the representatives of the International Association of Machinists and a committee of manufacturers at Lynn, Mass., indicate that the machinists' strike in that city was the beginning of a movement for an eight-hour day. The Machinists' Union is agitating an eight-hour day in New York and vicinity, but no date has been named for putting the new order into effect.

The new plant of the Standard Tube & Boiler Company, now being erected at West Niles, near Youngstown, Ohio, was almost completely destroyed by alleged union men, June 8. The plant is being erected by non-union men who have been interfered with ever since the work was started.

CONTENTS.

PAGE.

A German Cold Rolling Mill. Illustrated....1893
San Francisco and European Exports of Iron and Steel....1894
An Economical Electric Ore Hoist....1895
Iron and Shipbuilding in Scotland....1895
The Philadelphia Foundrymen's Association....1895
The Ernst Wiener Company's New Shops. Illustrated....1896
The Northwestern Iron Company....1898
Developments in Canada....1898
Milliken Brothers, Incorporated....1899
The Gilson Small Gasoline Engines. Illustrated....1900
Lackawanna Open Hearth Work....1900
No Labor Legislation Before Congressional Recess....1901
The Wilson Lathe Threading Tool. Illustrated....1901
The American Foundrymen's Association....1902
The General Electric Company's San Francisco Offices....1905
The New Greenaway Oil Separator. Illustrated....1906
An Important Customs Administrative Bill Reported....1906
The American Society for Testing Materials....1907
The International Association for Testing Materials....1907
Fast Coal Unloading....1907
A Proposed New Customs Bonding Regulation....1908
The Piqua Positive Blower. Illustrated....1908
The Western Malleable Steel Company....1909
Customs Decisions....1909
The Johns-Manville Sectional Steam Pipe Conduit. Illus..1910
Buffalo Terminal System for Niagara Power Supply....1910
The Wills Steel Cars. Illustrated....1911
Carbonic Acid as a Cause of Rust....1912
The Warren Foundry's Fiftieth Anniversary....1912
More Chicago Blast Furnaces....1913
Editorial:
The Labor Problem of the South....1914
The Sheet Trade....1914
The Cast Iron Pipe Industry....1915
A Contrast in Trade Policy....1916
The American Foundrymen's Association....1916
Correspondence....1916
The Government Armor Factory Again....1917
Independent Ore Companies Active....1918
New Publications....1919
An American Manufacturer's Observations in Germany....1919
Trade Publications....1920
Pig Iron Production Decreasing....1921
News of the Works:
Iron and Steel....1922
General Machinery....1922
Power Plant Equipment....1922
Foundries....1923
Bridges and Buildings....1923
Fires....1924
Hardware....1924
Miscellaneous....1924
Corrosion of Steel vs. Iron....1924
The Iron and Metal Trades:
A Comparison of Prices....1925
Chicago....1925
Philadelphia....1927
Pittsburgh....1928
Cincinnati....1930
Birmingham....1930
The German Iron Market....1930
Cleveland....1931
New York....1931
Metal Market....1931
Iron and Industrial Stocks....1932
The Iron Molders' Strike....1933
Obituary....1934
Personal....1934
The Machinery Trade:
New York Machinery Market....1935
Chicago Machinery Market....1937
Philadelphia Machinery Market....1938
New England Machinery Market....1938
Government Purchases....1939
Hardware:
Condition of Trade....1941
Notes on Prices....1942
Letters from the Trade....1943
The Hot Springs, Va., Convention....1944
Profit in Iron Fencing....1946
What Does It Cost a Retailer to Do Business. Illus....1947
American Hardware in Belgium....1947
Arkansas Retail Hardware Association. Illustrated..1948
Oklahoma and Indian Territory Convention....1952
Russell & Erwin Mfg. Company of New York....1952
Requests for Catalogues, &c....1952
United States Horse Shoe Company....1952
Price-Lists, Circulars, &c....1953
The Hardware Store of Neal & Brinker Company. Illus.1954
Among the Hardware Trade....1955
Miscellaneous Notes:
Hutchins Roller Swing Company....1955
Gifford's Galvanized Steel Plate Snow Shovel....1956
Portable Stand or Movable Bench. Illustrated....1956
The American Gate Hinge. Illustrated....1956
The Miller Fence Post Anchor. Illustrated....1956
Silk Pneumatic Golf Ball. Illustrated....1957
Exacto Packing Gauge and Cutter. Illustrated....1957
Paragon Cylinder Washer. Illustrated....1958
The Angle-graph. Illustrated....1958
Mrs. Hutchins' Strainer Spoon. Illustrated....1958
Sargent's Union Lock Sets. Illustrated....1958
Current Hardware Prices....1960

HARDWARE

THE problem of inspiring with energy and enthusiasm a force of traveling salesmen and keeping them attuned so that they will do their most effective work is one which constantly confronts large manufacturing and jobbing houses. In directing such a force it is important to remember that not all are equally endowed by nature with the ability of salesmanship and that not all are equally interested or well posted regarding the various lines to be sold. This is especially the case in connection with a Hardware jobbing stock, as the range of the business has widened very rapidly within recent years. Salesmen cannot always be expected to become at once expert in handling new lines and specialties without the proper kind of coaching, although a salesman of the proper spirit will make it his business to become informed in regard to the goods and be enthusiastic and intelligent in presenting their claims upon his customers. Neither is it the part of wisdom for the manufacturer or jobber to leave his men to find out in their own way and time the merits and distinguishing features of the brands of staple and seasonable goods which they are expected to market. A bright and especially an experienced salesman will indeed in time discover quickly the strong points and the weak points of different lines and evolve his own method of handling them; but the wise jobber or manufacturer does not leave his men to stumble on the best methods of selling his goods, thus wasting the time which he is paying for, and losing—sometimes past recovery—business which he might otherwise secure.

In connection with the effort to qualify the salesman for his work conferences between the merchant and his traveling force are recognized as exceedingly useful. In this way, as well as in other ways, the merchant or manufacturer endeavors to make his representatives conversant with the details of every line, to give them all the arguments to be used in efforts to make sales, and acts as a clearing house of ideas and experiences, successes and failures, the reporting of which he solicits and treats as a favor. Thus equipped his salesmen represent his concentration of thought, argument and energetic effort which qualify them to make successful, or at least intelligent, appeal to the merchants whom they visit. In this way the method of meeting an objection, new or old, with some telling argument or some ingenious and convincing resource of salesmanship becomes, after its first effective use, the common property of all.

Condition of Trade.

Extended inquiry among producers and merchants in numerous lines of trade develops opinions of marked unanimity as to current and prospective business conditions. Compared with the corresponding period of a year ago, the increases contrasted with that banner time differ somewhat in degree, but not in kind, except for an occasional instance relating to seasonable goods where the busy time has passed. Although the vacation season has begun there are representative houses now three to four months behind on orders, while in one instance quotations asked in May for supplies obtained no better assurance than probable delivery next January, and from the largest and most prominent company in the line at that. The Southern States, with a continuing growth in diversity of products, appear to be well favored, the prediction now being for a large crop of 10-cent cotton, which is double the price received not many years back. Railroad equipment, notwithstanding the great yearly increases in capacity, is severely taxed to move freight and passengers. Manufacturers and wholesalers are still working on orders which have been months on the books. Under such conditions not only is there no appreciable yielding in prices, but in some lines there are increases in already high rates, which, with labor unrest, demands for a higher wage and reduction of work hours per week, make unlikely any material price reductions in the near future. Among some there is expressed more immediate concern about executing back orders than obtaining new ones. A representative company, which both imports and manufactures, reports a volume of business since the beginning of the year greatly in excess of the corresponding period of 1905, which was then its maximum. Another house handling Heavy Hardware mentions an increase of approximately 40 per cent. in its business over the best record a year ago for corresponding time and is now three to four months behind on deliveries. Inquiries among various interests, both in manufacturing and wholesale distribution, elicit uniformly the same responses as to the favorable character of business conditions. Opinions are expressed that with the advances in some materials and increased labor costs there is no apparent likelihood of price concessions in the near future. With prices well maintained and crop prospects excellent there are in sight no disturbing factors except the ever recurring demands of labor.

Chicago.

Abnormal conditions continue to prevail in the Western Hardware trade and the seasonable falling off in the demand which customarily curtails sales during the present month has not yet appreciably affected the volume of business that is being transacted by the leading distributers. Sales already this month are greatly in excess of last year's record, and several jobbers report heavier sales than during the first two weeks in May. The heaviest buying is being done by contractors and builders, and the manufacturers of Builders' Hardware are now further behind on their orders than a year ago. The sale of mechanics' tools is also unprecedented and the jobbers are unable to maintain adequate stocks to meet the dealers' requirements. This is due to the inability of the makers, in spite of the record output, to keep pace with the demand. Prices remain on a normal level and additional buying is thereby stimulated. Heavy filling-in orders for all classes of summer goods are now being received and the movement of Wire Cloth and Netting continues heavy, notwithstanding the large purchases made earlier in the year. The prices of both commodities remain unchanged and on Wire Cloth deliveries are being made more promptly than at any time in the past few months. The Sheet advance announced by the mills last week has been followed by a like increase in store prices, and galvanized material owing to its scarcity is held on a higher basis from stock. Deliveries on wagon malleables, with the exception of clevises, are now being made fairly prompt, although implement castings are scarce and high in price. The Nut and Bolt markets are in excellent condition and prices are well maintained. Deliveries on assorted lots of Bolts are still deferred by manufacturers and there is no indication that better shipments can be made for several months. Sheet Zinc has again been advanced 10 cents, restoring the same basis that prevailed before the recent decline.

NOTES ON PRICES.

Wire Nails.—New business received by the mills varies to some extent according to territory, but on the whole the demand is fairly large. Prices are generally steady, although in some districts where mills have favorable freight rates slight concessions are reported as being made. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in ten days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—The demand for small lots from store continues moderate. Quotations to the general trade for small lots from store are on the basis of $2.15 per keg.

Chicago.—Notwithstanding the fairly heavy demand for Wire Nails concessions of 5 cents a keg are being made by one of the leading independent manufacturers. This basis is, however, not being met by the leading interest, official quotations being strictly maintained. Thus far this month the demand for all classes of Wire products exceeds that of the same period in May and the indications are that all of the plants of the American Steel & Wire Company will be operated in full throughout the summer months. Specifications for smooth wire for industrial purposes is unusually heavy, and furnaces and departments which heretofore have closed down at this season of the year are being operated at their capacity to meet consumers' needs. Official quotations are as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The active season in the Wire Nail trade is pretty well over and the amount of new business being entered by the mills is correspondingly small. Contracts have been pretty well filled, but the mills still have a fair amount of tonnage on their books and are quite busy making shipments. Stocks held by jobbers are said to be rather light, and for this reason the mills expect a fairly active demand right along, but nothing out of the ordinary. It is probable that quite a number of Wire Nail mills will close down about July 1 for inventory and this will decrease output very considerably, making it conform more to actual demand. Prices, on the whole, are being maintained, but are being shaded in some districts by mills that have favorable rates of freight. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.ob. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in ten days.

Cut Nails.—Filling specifications on contracts forms the principal demand upon the mills, although they are receiving some new business. Quotations are as follows: $1.75, base, for carload lots, f.o.b. Pittsburgh; $1.85 for less than carloads, f.o.b. Pittsburgh; $1.95 for carload lots, on dock, New York; $2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—The demand is about in the usual proportion to that of Wire Nails. Quotations to the general trade for small lots from store are on the basis of $2.05 per keg.

Chicago.—Attention of the mills is principally directed to the filling of specifications on old contracts, though some new business is being taken on. Irregularities in price continue to prevail, in the shape of concessions of from 5 to 10 cents a keg. Quotations are as follows: Steel Cut Nails in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—A fair amount of new business is being placed, but the mills are running mostly on contracts. The Cut Nail mills are still pursuing the policy of limiting output as far as possible to meet actual current demand. We quote Cut Nails at $1.75, base, f.o.b. Pittsburgh, for car load lots, and $1.85 in less than carload lots. For Iron Cut Nails an advance of 10 cents per keg is charged.

Barb Wire.—Shipments on contract orders continue heavy, but new business from the Hardware trade is comparatively light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Galv.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—The situation remains practically unchanged, the buying being limited to small lots from distributers' stocks. Quotations are firmly maintained, as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60. Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New business from railroads continues heavy, but orders from jobbers and the general trade are very light in volume. Shipments by the mills continue heavier than usual for this season of the year. Prices are fairly strong, as follows: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in ten days.

Smooth Fence Wire.—The aggregate of orders from various sources is large, and some industries have placed contracts for delivery during the balance of the year. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Large contracts are being placed by Spring manufacturers for last half requirements, and in a few isolated cases contracts running through the ensuing twelve months have been closed. The demand for tempered and annealed Wire for industrial purposes continues unusually heavy, the season considered, inasmuch as this is usually a slack period, and according to previous custom many mill departments operating on this material shut down during the months of June and July. The movement of Bale Ties is also heavy, although concessions are reported in open territory. Prices continue to be well maintained, as follows: To jobbers, $1.85, f.o.b. Chicago, in car lots, and car lots to retailers, $1.90.

Pittsburgh.—The demand for Wire from the general trade, aside from the Woven Fence manufacturers, is quite large and shipments by the mills are heavy. We note that a good deal of tonnage has been entered for delivery in last half of the year. Prices are being fairly well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

French Pattern Rat and Mouse Traps.—Following are the prices quoted on the line of French Pattern Rat and Mouse Traps, which are put on the market by the Detroit Wire & Iron Works, Detroit, Mich.:

	Size.—Inches.	Per dozen.
No. 1 Rat Traps	19 x 10 x 8	$4.00
No. 2 Rat Traps	17 x 9 x 8	3.00
No. 3 Rat Traps	15 x 8 x 8	2.50
Mouse Traps	8½ x 4½ x 4½	1.75

Cotton Wicks.—There is some irregularity in quotations on Lamp, Stove and Heater Wicks. A change in discount on this line was announced by important interests the first of the month, as reported last week in these columns. The new price represented a considerable decline, being approximately 30 per cent. lower than prices previously ruling, but additional concessions on the part of more than one manufacturer have been reported.

Sheet Zinc.—Under date of June 9 announcement is made of the advanced price of $7.75 per 100 pounds on Sheet Zinc in 600-pound casks of the thicknesses from Nos. 9 to 22, inclusive, and of the widths from 32 to 58 inches, inclusive, and of the lengths from 72 to 96 inches, inclusive, delivered, f.o.b. cars, La Salle, Ill. This price is subject to discounts, as follows:

	Cash with order. Per cent.	Quantity. Per cent.	Total Per cent.
Carload lots	3	5	8
9000 pound lots	3	3	6
6000 pound lots	3	2	5
3000 pound lots	3	1	4
Less than 3000 pounds	3	0	3

Paris Green.—There has been no change in the base price of 21 cents for Paris Green. Demand, while not extremely large, is considered good. Quotations are as follows, on 5 tons and over:

Arsenic kegs ..... 21 c.
Kegs, 100 to 175 pounds ..... 21½c.
Kits, 14, 28 and 56 pounds ..... 22½c.
Paper boxes, 2 and 5 pounds ..... 22½c.
Paper boxes, 1 pound ..... 23 c.
Paper boxes, ½ pound ..... 24 c.
Paper boxes, ¼ pound ..... 25 c.

Terms, 30 days, f.o.b. New York.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds ..... ½c.
1000 to 5000 pounds ..... 1c.
500 to 1000 pounds ..... 1½c. to 2c.
Less than 500 pounds ..... 2c. to 3c.

Rope.—The market remains in an unchanged condition, with a moderate demand. For large and desirable orders it is understood concessions of ¼ to ½ cent per pound are sometimes made on the price for No. 2 quality Sisal Rope below regular quotations. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality, 8 cents per pound.

Linseed Oil.—The demand is confined to immediate requirements, and these are light. Buyers appear to be supplied for some time to come, and a revival of business is not generally anticipated until fall. There has been considerable Oil offered by resellers, which has tended toward weakening the market. It is stated that at the present price of seed crushers cannot sell State and Western Oil at ruling prices without losing money. A reduction of 1 cent per gallon has been made in the price of City Raw, but no change has taken place in out of town Oil. Quotations are as follows, according to quantity: City Raw, 39 to 40 cents per gallon; out of town Raw, 37 to 38 cents per gallon. Boiled Oil is 1 to 2 cents per gallon advance over Raw.

Spirits Turpentine.—The Southern market is steadier, which has had a beneficial effect upon the New York market. Demand in the local market has been moderate. New York quotations are as follows, according to quantity: Oil Barrels, 60½ to 61 cents; Machine made Barrels, 61 to 61½ cents per gallon.

Window Glass.—At the meeting of the Eastern Jobbers' Association, held last week, no change in prices was made. Additional Glass factories are being shut down each week on account of hot weather, which causes workmen to refuse to work, or because it is necessary to withdraw fires to prevent accidents. Single strength Glass is becoming difficult to obtain, as is shown by one factory refusing to accept an order for less than 200 boxes, as it had orders on its books for all it could possibly turn out before closing down, owing to the reduced force of workmen and inefficient service of those who remain. Local demand is light. Jobbers' quotations are as follows: Eastern district, 90 and 10 per cent. discount for all sizes of single and double strength; New York City, 90 and 10 and 5 per cent. discount for all sizes of single and double strength.

C. H. GARITY, formerly with the Neal & Brinker Company and Western Electric Company, has recently identified himself with the office force of Wm. B. Fox & Bro., 21 Warren street, New York.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

The Publication of Jobbers' Catalogues

From a New Jersey Manufacturer: Up to three years ago, at which time the matter of manufacturers paying for space in jobbers' catalogues was taken up and discussed before the American Hardware Manufacturers' Association, at their annual convention held at Atlantic City, it was customary for the jobbers to solicit ads from the manufacturers and for the manufacturers to give assistance. The practice had reached a point where it became a positive nuisance, the price per page advancing from $5 to $50, and, in some cases, $100. Some of the jobbers evidently got the idea that the manufacturers should defray the cost of printing the catalogues and leave a profit for them. Fortunately there is not quite so much of it now.

Exhibits at Hardware Conventions.

From a Member of the New York State Association: We are pleased to see the article from "Manufacturer" in regard to exhibits at the different conventions. We believe there are a number of abuses in connection with the meetings that should be done away with, and this is one of them. Of course we often see some things that might not be called to our attention if they were not shown there, but if members of the associations go to the conventions for the express purpose of seeing how many souvenirs can be secured and how much can be spunged out of the exhibitors and traveling men, as some have seemed to, then it is time that the object of the meetings be made plain to them. It seems to us that the nearer we keep to the original purpose of the association the greater the good we will carry home with us.

A Guarantee Which Caused Trouble.

From a Merchant in California: For the benefit of your readers I would like to tell of a very interesting experience the writer had recently. A steel range was sold to a very responsible old Italian who had two sons who were equally good pay. In making the sale the range was guaranteed for 15 years.

About 60 days later the old gentleman was asked for a remittance. He refused to pay any part of it, claiming that inasmuch as the range was guaranteed for 15 years he would not pay until the expiration of that time. All kinds of arguments were brought to bear on him, and as a last resort he was asked, what if he should die before 15 years? Immediately he replied that his boys had money and property, and as they were "good honest boys," they would pay.

It required several trips into the country, 8 miles distant, and finally after six months the range was paid for in full. Strange to say, the old man died three days after he was induced to make the payment.

Contact with Farmers.

From a Lumber and Builders' Material Merchant: Among the side lines which can be carried advantageously in connection with Hardware, Lumber, Building Materials, &c., is Fencing. We have handled it with profit in itself, while the fact that it has brought us into close touch with the agricultural community has also been used to good effect. We would not discontinue the handling of Woven Wire Fence, as it is one of our most profitable lines.

C. F. Crooks has purchased the Hardware business of Belden & Jones, in Quincy, Kans.

THE HOT SPRINGS CONVENTIONS.

(*By Telegraph.*)

THE tenth semi-annual convention of the American Hardware Manufacturers' Association and the sixteenth annual convention of the Southern Hardware Jobbers' Association met on Tuesday in joint assembly at Hot Springs, Va. For several days the spacious Homestead Hotel kept filling up with Hardwaremen, many of whom went last week to enjoy a few days' rest and recreation prior to taking up the active work of the convention. These early arrivals included most of the officers of both associations and members of the Entertainment Committee, who have spared no pains to perfect all arrangements for comfort and pleasure as well as for the formal business to be transacted. The train leaving New York Saturday morning and arriving at Hot Springs that night carried a party of about 50, who availed themselves of the opportunity to spend Sunday in this delightful spot. Another large party arrived Tuesday morning, having had special accommodations on the train coming through from the North the night before.

The opening sessions have been of a most auspicious character, auguring for a highly profitable and enjoyable series of meetings. There is a large attendance, members of the Manufacturers' Association being particularly well represented. The occasion is also graced by an unusually large number of ladies, whose presence lends much to the pleasure and brilliancy of the gathering.

Opening Sessions.

Tuesday morning was occupied by a meeting of the Executive Committee of the American Hardware Manufacturers' Association, at which their plans for the convention, already in admirable shape, were finally completed.

At the same hour the jobbers held their opening session, which was of an executive nature, consisting of the reports of officers and committees and miscellaneous business. In his annual address, which was broad in scope and covered subjects of national as well as of trade importance, President F. B. Dunlop, Fort Smith, Ark., alluded to the growing cordiality of the relations between manufacturing houses and members of the association and expressed the belief that never before had each so respected and appreciated the work of the other. He emphasized the importance to the country of the export trade in manufactured products and the necessity of adequate and effective consular service for the benefit of foreign commerce. He congratulated the trade on the defeat of the recently proposed postal legislation, but admonished them to be alert against further pernicious measures that are certain to crop up later in some disguised form.

Secretary-Treasurer C. B. Carter, Knoxville, Tenn., in submitting his report congratulated the association that there had been a total absence of complaints to be acted on between members. He suggested, however, that while there could be no possible objection to a jobber reaching out as far as possible for trade, there is an equity of interest which should discourage making some other jobber's territory a dumping ground for goods on which one is overstocked or has secured some inside concessions. He also referred to the work which had been done by the Transportation Committee, pursuant to the stand taken by the association in favor of Governmental railway rate legislation.

The report of the Executive Committee, presented by O. B. Barker, Lynchburg, Va., chairman, was marked by a special recommendation for uniform size loose leaf catalogues. Special recommendations as to exact size, &c., were made by the committee appointed to consider this matter. It was announced that all committees now organized would continue to serve throughout the convention. The meeting closed with a report of the Committee on Mutual Fire Insurance.

The First Joint Session

was called to order on Tuesday afternoon by President Dunlop of the Jobbers' Association. After prayer by

jobbers' association.

"America," C. W. Asbury, vice-president of the Manufacturers' Association, made a brief address of greeting. In the absence of President F. S. Kretsinger, who is touring Europe this summer, the association is fortunate in having the efficient and energetic service of Vice-President Asbury at this convention. An address of welcome full of characteristic Southern eloquence and hospitality was delivered by G. E. Nelson of Hot Springs, after which S. G. Gilfillan, Ironton, Ohio, made a witty and enjoyable address on the subject of "Good Fellowship," in part as follows:

What a grand subject and yet how appropriate! For where will you find as much good fellowship to the square foot as at a joint convention of the Southern Hardware jobbers and the American Hardware manufacturers?

I deeply feel my utter inability to properly handle the subject and still I am willing to do my best toward entertaining and interesting you. I concluded that I would look up the meaning of "good fellowship," but the more I looked the less I knew and was convinced that it was too deep for me. I therefore concluded that the best definition I could give was the "Golden Rule," *i. e.*, "Do unto others as you would have others do unto you," and that would be the acme of good fellowship. If one would follow this rule what a genuine good fellow he would be! And how happy we would all be if we always treated others as we would have them treat us!

And yet, there are a great many ways, that is, supposed ways, of being good fellows; and that brings to my mind a conversation that took place between a very sick man and some of his friends who were visiting him: The aforesaid sick man in a very deliberate way said: "Well, boys, if I die I suppose that you will send flowers to my funeral," and his friends replied, "Yes, indeed, we will!" The sick man then said, "To cost as much as five dollars?" His friends replied, "Yes, perhaps more"; when the sick man replied, "Well, cut the flowers out and give me three dollars in cash, for I need the money." The moral to this story is to say or do the good things while our friends are alive, rather than after they have passed into the great beyond.

Has it ever struck you what a sweetener of life lies in a few words of appreciation and encouragement? How few of us take the trouble to stop a few moments and praise a servant for work well done, or even pause to tell our nearest and dearest how we appreciate all the daily services which we have apparently never noticed. When our friends die we hasten to send beautiful flowers as a last appreciation of our love for them. But would it not be better if we helped them by a little praise when they were working, or if we had cheered them in the dark days when they were troubled and suffering? Only a few kind words of appreciation. The cost is nothing, but the recompense is beyond price. Let the husband tell his wife how much he prizes her love for him, and the wife tell him how truly she recognizes all his care for her. And the mother should reveal in words how much she values her children's affection, while the child who says to its mother "Thank you for all your love to me," has rewarded her far beyond knowledge or understanding. And yet I do not propose to preach a sermon, but simply to say that as we lead but one life here on earth we must make that life beautiful; and to do this good fellowship is absolutely necessary.

The report of the Reception Committee presented by its genial and popular chairman, Irby Bennett, included announcements in regard to the banquet and other arrangements for the pleasure of those in attendance at the convention. An enjoyable musical entertainment was the feature of Tuesday evening.

Wednesday's Session.

The Manufacturers' Association held an executive session on Wednesday morning, at which reports of various committees were read and discussed. The jobbers also held an executive session, most of which was devoted to papers and discussions of two topics, "Increased Expenses Demand Increased Profits," and "Trade Courtesies Due a Competitor." In the afternoon there was another joint session of manufacturers and jobbers, at which there was a discussion of "The Effects of Quantity Differentials," which was opened by a paper by W. W. Webber of Fort Smith, Ark., given below. We are also permitted to give the paper by W. L. Sanford, Sherman, Texas, on "Best Methods of Posting Traveling Men," which will be read at Thursday morning's session of the Rev. J. G. Scott of Hot Springs and the singing of

THE EFFECTS OF QUANTITY DIFFERENTIALS.

BY W. W. WEBBER, FORT SCOTT, KAN.

The term quantity differentials and the effect of same for the purpose of argument means the making by a manufacturer of low price to a large buyer and a price that is higher on the identical goods to a smaller buyer, when each one buying must compete in the same territory for the same trade. That this is true and has been true from time immemorial cannot be successfully denied, but the fact that it has remained is no argument in defense of it, and it does not prove that the practice is right or that it is good business.

At the time each manufacturer was operating his plant independently of all others in the same line of business it was possible for the small or medium buyer

TO GET CONCESSIONS

that would put him in line, but in this day of consolidations or gentlemen's agreements, or pooling, where there is a fixed and fast price and the trade is parceled out and assigned to A, B and C lists, with a 5 or 10 per cent. differential prevailing between each, the man whose business does not warrant the purchase of the first or second quantity is handicapped to the extent of the differential, and just so long as this practice prevails just that long will the manufacturers' product be distributed in an unnatural and unequal way.

THIS IS AN AGE OF QUICK TRANSPORTATION

and a time when a buyer is not confined to any particular market. If B makes a price on an article that is not satisfactory to the buyer he interviews A, and if the latter has the former bested in buying he has him on the hip in selling, and the result is A gets the business at a margin, whereas if B takes it at the competitive price he has lost money, and he must take it or keep his goods, because A has set the pace. This is not confined to one or two items in a man's business, but, on the contrary, has grown limitless in its ramifications until it affects our entire line.

I have always been led to believe that it was my duty to foster and encourage a customer, to build him up and help him to expand, to the end that he may be useful to me; that I may use him to make money for myself while he makes money for himself; that it is

A FOOLISH AND MISTAKEN POLICY

to load him to the gunwales with an item that I know he cannot sell profitably in competition with his neighbor, and of course I do know, because I am master of the situation, and when I thus make fish of one and fowl of the other and expect both to be useful to me disappointment awaits me around the corner. We only ask that we be put on an equitable basis; that if differentials must be made they should not be so glaring and unequal as to amount practically to a prohibition. You can never hope to have an even distribution of your business and numberless loyal and satisfied customers when, with knowledge aforethought, you deliberately equip one man to annihilate another. It is one of the impossible things in business.

Those to whom you give the hot end of the poker will never remember you very kindly, and those to whom you give an inside put on the ground, so to speak, always have a sneaking idea that some other fellow is in the cellar. That is human nature to a hair.

WHENEVER YOU PLACE A CUSTOMER AT A DISADVANTAGE

you must know that in so far as your line is concerned he cannot make a success of it, that if he sells your goods at all it must be done at a niggardly margin or no margin at all and that eventually he must cease to be useful to you. Were he to give you an order for enough goods to command the inside you would remark that he needed a guardian and then and there advise your credit man to keep a weather eye on him, and yet you place temptation before us every day, knowing that if we take the small amount at the long price we are destined to unload at no margin, and if we take the greater quantity to get the short price we have water on the brain.

We are not croakers, but we do insist that we should not be expected to accomplish the impossible; you must not expect us to get $1 for an item that can be bought for 90 cents, especially when the item is one of your own make and this difference in price made possible by you. If all your customers had the

SAME BUYING AND DISTRIBUTING CAPACITY

this question would never rise, or if it did would solve itself. There is no necessity for specialization or the calling of names, but there are seated here to-day manufacturers who know that my allegations are true, though their deductions may not be the same as mine, and I would not have them infer that we are making a demand —but only an effort to demonstrate to you that under the present conditions your policy is wrong; and as proof of this we cite that on any item where there is free and open competition, with no strings tied to it in the way of classified lists, the business is done by those who are favorably located in the matter of freight rates, but on all items the sale of which is manipulated by a joint agreement of those producing them and where the quantity governs the price you find a different state of affairs.

I concede that there may be conditions under which a quantity price must be made by a manufacturer. One would be where he has produced too much or the consumption has not reached the propositions he figured on and he must unload to lighten his burden; but where a manufacturer has a steady and even demand for his product and his output is controlled by years of experience in his line such a condition is rarely seen, and in naming his selling price it occurs to me that wisdom would dictate that he make it possible for all who handle his product to make a reasonable price.

ELIMINATION THREATENED.

There are jobbers before me to-day to whom some Hardware items are absolutely distasteful, and they are striving with might and main to eliminate them from stock, and while the manufacturer whose goods come under this ban may be strongly intrenched and hard to oust the time will surely come when he will feel the effects. The constant dripping of water will wear away the hardest stone.

BEST METHOD OF POSTING TRAVELING MEN.

BY W. S. SANFORD, SHERMAN, TEXAS.

There are two classes of jobbers, and their business methods are largely dissimilar, those situated in the large cities, whose traveling men are handled exclusively by mail, and those located in smaller trade centers, whose traveling men report in person to the house every week or two. We belong to the latter class, which indeed constitutes the majority of the membership of the Southern Association, and it is to them alone that my remarks are directed.

TRAVELING MEN ARE A TREMENDOUS FACTOR

in the success of all jobbing houses, and to underestimate their worth is a grave mistake. In character and ability they are equal to the men of any profession, and in resource and energy they outstrip them all. The unsuccessful soon drop out, while those who fully measure to the standard requirements are men of force, sound judgment and broad business views, who in many instances are superior to the men under whom they work. They receive the best pay of all employees—because they earn it—and when there is an important vacancy in the house it is generally filled by a man who has served a term on the road. The office man, treading daily the same worn path, performing the same routine of work, surrounded by the same people, and hedged in by the narrow limitations of his little workshop, frequently becomes dwarfed in his views and narrow in judgment, while the traveling man, out in the busy world, in constant contact with the representatives of other houses, both in his line and others, meeting people of all kinds and from many sections with their various and novel ideas, mingling with the consumer, the retailer and the railroader, viewing men and measures from a higher point, becomes himself broader every day of his life. And these facts should be ever borne in mind in dealing with him.

MANY OF HIS MISTAKES

are from lack of information, for which his house, and not himself, is responsible. He is susceptible of business education and is anxious for it, and if he is not well informed it shows that there is something wrong with the system in the house. He occupies a position different from that of any other employee. While the house shapes a general policy and establishes certain rules for his guidance still the details must be left to him, and away from the house he must exercise his own judgment and meet the ever changing conditions as he finds them.

IN THE SALE OF GOODS THE POSTED MAN

is always the master of the situation. I found this true in my ten years' experience on the road, as well as in a subsequent and equal experience as buyer and manager of a business. If the buyer knows more of the details of manufacture, of freight rates and market conditions than the salesman, then the latter is at a decided disadvantage; and the opposite is true when the situation is reversed. It is also a fact that the best posted salesman, all else being equal, invariably controls a larger business than his competitors. We are all prone to yield our judgment and patronage to those who know more on a subject than we do, and are slow to give a hearing to those whom we think know less. What is true in all other matters is especially true in the purchase and sale of goods. Now, if these statements are correct, and I am sure that no one will challenge them, it follows that the thorough posting of salesmen is a matter of vast importance to a house, and so fully am I entrenched in this belief that I devote more time and thought to this work than to any other part of our business.

WHERE FREIGHT RATES PLAY AN IMPORTANT PART

in the purchase and sale of goods, as is the case in the Southwest especially, the salesman should be made familiar with both the distribution and interstate rates and the shipping cost of goods. The price of an article in Chicago may be 25 per cent. less than the local price, but when the transportation charges are added it may be shown that the local price is 10 per cent. less. The shrewd and unscrupulous competitor may sell goods for direct shipment from factory, stating that they weigh about so much and take fourth-class rate, when in fact they weigh more than stated, and take possibly first-class rate. Again, the large jobber, possessing greater influence, may underbill the weight of shipments, securing a less than tariff freight for the customer. This is often done, and works a severe injustice to the local jobber. In some cases the shipments are billed so low that the retail merchants get local shipments at a less rate per hundred pounds than the jobber pays on carload shipments. The salesman should be in a position to show up such false statements and such unfair competition, and by so doing secure the business to which he is entitled by reason of having a lower delivered price. The profit of a local jobber is practically the differential between carload and less than carload rates, and as this difference is diminished so is his profit. Therefore, the salesman must be a freight man also, and watch that interstate rates be not lowered by the sharp and illegal practices of the larger jobbers.

FAMILIARITY WITH MANUFACTURES.

The salesmen should be given all information possible relative to the manufacture of goods, and the methods employed by manufacturers and used by competitors to cheapen the cost of goods. If his competitor is selling a 45-lb. Vise stamped 50 lbs.; or 7-oz. Wagon Covers stenciled 10 oz.; or Tinware made of 85-lb. instead of 100-lb. plate; or Patent Grass Snaths labeled Patent Bush; or stamped instead of Drawn Steel Rakes, or lighter than standard gauge Corrugated Iron, he should be able to detect and expose the fraud. A large number of local salesmen actually believe that large jobbers manufacture the goods bearing their trademark; while, as a matter of fact, they are the same goods which their own houses are offering for sale, the only difference being in the paper labels which they bear.

Furthermore, many old patents have expired, and many imitation goods are being placed upon the market constantly, and it is very necessary that the salesman be kept informed on the subject, otherwise we find him trying to meet with the genuine article the price on the imitation. This can be accomplished by putting before him whatever information the buyer may gain by his visits to factories, or by conversation with their representatives. And here it might be stated that a buyer can make no better investment of his time and means than by visiting as often as possible the factories from which he buys. He gains information that cannot be obtained in any other way, and this becomes doubly valuable when imparted to his traveling men, and this should be done at every opportunity.

SHOULD KNOW THE ACTUAL COST.

The salesmen of local jobbing houses should be given the actual delivered cost of the goods. I know that this policy will meet with much opposition, but I would rather rely upon a man's intelligence than upon his ignorance. It is true that a salesman having the correct cost will more often cut the selling price, but it is also true that in many cases he will fail to secure the business by not having the actual cost. It is just as easy to educate a salesman to get 20 per cent. as 12½ per cent. profit, or 30 per cent. as 20 per cent. profit, and when you have educated him to get the profit your business demands you have accomplished something worth while. You have attained an object that will be of service to the man, and through him a vast benefit to you.

IT IS A WHOLE LOT BETTER AND SAFER

to drive a horse with open bridle, having him become accustomed to the cars, than to anchor your safety on the fact that he has on blinders and cannot see the things that might frighten him. It is all in getting a man started right, in getting his sights elevated to the proper hight. The salesman gets a big profit on Razors, not because he doesn't know the cost, but because he is educated to get it. I believe in appealing to a man's pride, intelligence and ambition, in having him feel that he is a part of the business, and that the success of the business depends upon his effort and judgment; and this is quite true so far as his own territory is concerned. I believe in

WINNING HIS CONFIDENCE

by freely imposing confidence in him. But if you find a man that is insensible to such an influence, then it is best to let him go. I believe in sitting down with a salesman and having a frank, informal talk, swapping experiences, exchanging ideas, discussing policies and reviewing conditions, getting his views on plans and prices, and then adopting them if they are better than mine, and they frequently are. After such a conference he will have learned a great deal, and so will the manager, if his mind is not clouded with self importance and self assertion. A salesman that cannot be entrusted with the actual cost of the goods is not worthy of the place he fills, and the quicker you get rid of him the better.

In this paper I have endeavored to emphasize the matters upon which a salesman should be posted, viz.: Freight rates and classification, shipping weight of goods, manufacture of goods, light weight and imitation goods, cost of goods.

JUST WHAT MEANS SHALL BE EMPLOYED

in conveying this information is a matter of individual preference. In our own business we supply our salesmen with condensed tariff sheets, giving the competitive rates into their territory; we issue weekly change sheets, giving the actual delivered cost and selling prices, and in parallel columns what the goods would cost to-day. This encourages them to make a profit based on the advance, and at the same time puts them in position to meet competitors who continue selling at the old cost, as many frequently do. We also file in a regular and convenient place for their inspection all letters that we think will be of interest and benefit to them; and these they usually look over whenever they come to the house. This puts them in a position to talk intelligently to the trade on all subjects relating to the Hardware business. In fact it educates them, and that is the object toward which we strive.

PROFIT IN IRON FENCING.

REFERRING to the article in our last issue in which the profitableness of Iron Fencing as a line for Hardware merchants to take up and push was set forth at length, the Stewart Iron Works Company, Cincinnati, Ohio, a very large manufacturer of plain and ornamental Steel and Iron Fencing and general ornamental Iron and Wire work, states that it has formulated an active campaign having for its object the education of the Hardware merchant along the lines referred to in the article, pointing out to him why it is to his advantage to handle such products. The company believes that there is not a community in which some Iron Fence and Lawn Furniture cannot be sold if the progressive merchant will push these goods to the front, and substantiates its convictions by pointing out a few of the many places in which Iron Fence may be employed, such as residences, churches, cemetery lot inclosures, school houses, factories, cemeteries, court houses, parks, hospitals, bridge approaches, monuments, speedways and boulevards. The company will be pleased to forward upon application printed matter setting forth the merits of its products and to supply valuable information that is calculated to enable the Hardwareman to present the subject of Iron Fencing, Lawn Furniture specialties and the general line of Ornamental Iron work in such a manner as will insure to the merchant sales of a line heretofore neglected by many, and with considerable profit to himself.

WEBSTER R. WALKLEY, managing director of the New York branch of the Peck, Stow & Wilcox Company, 27 Murray street, New York, was given the honorary degree of Doctor of Civil Law (D. C. L., *legis civilis doctor*) on the occasion of the one hundred and twenty-third commencement, June 6, of Dickinson College, Carlisle, Pa. This college is the second oldest in Pennsylvania, having been organized in 1783, and of which George E. Reed, S. T. D. and LL. D., is president. Mr. Walkley is a graduate of Wesleyan University, Middletown, Conn., class of 1860, and for 15 years has been one of its trustees, being elected by the alumni.

THE annual meeting of the New England Iron & Hardware Association will be held at Young's Hotel, Boston, Tuesday evening, June 19, at which time it is expected officers for the ensuing year will be elected and reports of committees received.

WHAT DOES IT COST A RETAILER TO DO BUSINESS?

BY E. N. HOWELL.

ESTIMATES of the cost of conducting a retail Hardware business, made at many of the retail Hardware conventions, vary so greatly that it is evident that some merchants do not keep close track of their expenses, that widely different methods are used for arriving at the result or else local conditions vary in a surprising degree.

One Method

The accompanying diagram shows how we keep account of our expenses. We do not claim it is a particularly good way, but give it for what it is worth, and with the hope that it will draw out expressions from other merchants. The illustration shows the ruling and column headings of a book which we have made especially for the purpose. Its actual size closed is 7 x 10 inches, although the large number of columns required makes it necessary to run them across both left and right hand pages. There is one horizontal line for each day of the month and one for the footings of the columns. The entries shown are for part of a month only, but are sufficient to explain the idea. Items are posted each day in this expense book from the credit side of our cash book, and are nothing more than the amounts paid out, classified under various headings. They could just as well be shown in a multiple column cash book, except that the great number of divisions would make such a book a little cumbersome.

Classified Payments

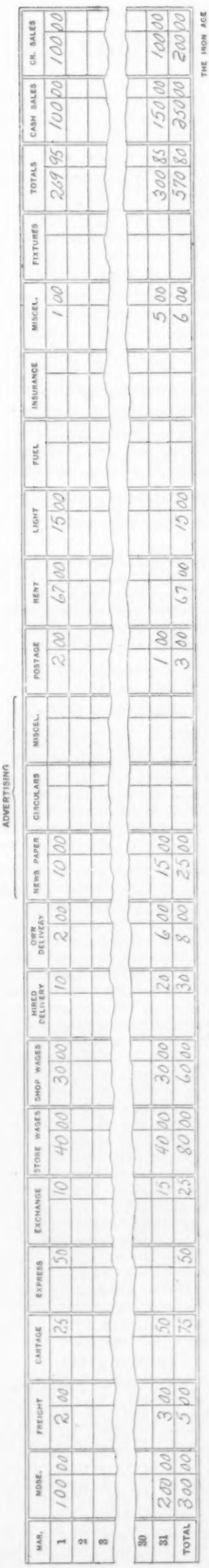
Classifications may, of course, be varied according to a proprietor's wishes. Another merchant would perhaps subdivide his expenses differently. For example, he might combine his freight and cartage, and perhaps his merchandise, under one head. We would prefer to separate them, for the reason that if we want to contract with a truckman, for instance, to do our hauling for the year we can act more intelligently if we know exactly what we have paid for this work in the past year. Merchandise and cash and credit sales are shown, not as expenses, of course, but for the sake of having these statistics close at hand. It will be noted that the total of the horizontal footings must coincide with the total of the vertical footings to prove the work.

Divisions May Vary

The two active partners of our business draw a monthly salary, which goes into the "Store Wages" column along with the clerks' salaries. We own our own building and pay ourselves the rent monthly according to the market value of the building. How many retailers do these two things? Every one of them should do so.

Salaries and Rent

The interest and value of this account comes at the end of the year, when you can tell exactly what percentage of the cost of your goods your expense has been. You can tell what percentage your advertising, or clerk hire, or freight has been. When you mark your goods you can tell how much you must add before you begin to make a profit, and the size of this percentage would surprise many merchants.


ADVERTISING
MAR.
NOSE.
FREIGHT
CARTAGE
EXPRESS
EXCHANGE
STORE WAGES
SHOP WAGES
HIRED DELIVERY
OWN DELIVERY
NEWS PAPER
CIRCULARS
MISCEL.
POSTAGE
RENT
LIGHT
FUEL
INSURANCE
MISCEL.
FIXTURES
TOTALS
CASH SALES
CR. SALES
1 100 00 2 00 25 50 10 40 00 30 00 10 2 00 10 00 2 00 67 00 15 00 1 00 269 95 100 00 100 00
2
3
30 5 00 300 85 150 00 100 00
31 2 00 00 3 00 50 75 15 40 00 30 00 20 6 00 15 00 1 00 5 00 570 80 250 00 200 00
TOTAL 3 00 00 5 00 1 50 2 50 80 00 60 00 30 8 00 25 00 3 00 6 00 1 500 00 450 00 300 00
THE IRON AGE

Reproduction (Reduced) from Expense Book of E. N. Howell Hardware Company. Actual Size of Book Closed, 7 x 10 Inches; Headings Extend Across Both Right and Left Hand Pages.

AMERICAN HARDWARE IN BELGIUM.

FROM A SPECIAL CORRESPONDENT.

AMERICAN manufacturers of Hardware generally will find Belgium a very good market for their products. The duties (15 per cent. average) are not excessive and the demand is very good; almost any kind of American Hardware finds a ready sale here. Machines and Tools for Metal Workers, Agricultural Machinery and Tools, Lawn Mowers, Hay Forks, Files, Wrenches, Household Goods, Coffee Mills, Washing Machines, Saws, Carpet Sweepers, Shade Rollers, Clothes Pins, Oil Stoves, &c. This list could be lengthened *ad lib.*, but enough to say that American goods are always well received here and enjoy a first class reputation.

Arkansas Retail Hardware Association.

THE seventh annual convention of the Arkansas Retail Hardware Association was held on the 5th, 6th and 7th inst., at Little Rock, the sessions being held at the Hotel Gleason. The meeting was largely attended and was characterized by much enthusiasm. Reports showed that the association had made quite a substantial gain in membership during the past year, more than 30 accessions being also reported during the meeting. With this development the traveling men who visit the merchants of the State and who were elected to associate membership at the last annual meeting had a good deal to do, and much appreciation of their interest in the association and co-operation in its work was expressed.

The convention was called to order on Tuesday morning by the president of the association, Thomas B. Stewart of Newport, prayer being offered by the Rev. O. J. Wade. An eloquent address of welcome to Little Rock was delivered by Hon. Geo. C. Naylor, editor of the *Arkansas Democrat*, a very felicitous response to which was made by Emmett E. Mitchell of Morrilton.

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The following convention committees were appointed by the president:

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PRESS.—J. F. Maxey, Ozark; J. B. Hurley, Warren; C. E. Taylor, Little Rock.

RESOLUTIONS.—T. J. Mott, Helena; W. M. Harrell, Conway; Harry Hawkins, Monticello.

President's Address.

The annual address of President Stewart was a lengthy and interesting document, in part as follows:

For the past few years we have been passing through what might be termed the structural period in our organization, building as it were a structure that we expect to utilize in the betterment of our condition as tradesmen and merchants.

AS TO HOW WISELY WE HAVE BUILDED

will depend entirely on our ability to serve the purpose of those with whom we must deal, of which there are four factors to be considered: First, the consumer, our customer; second, the retail distributers of merchandise, ourselves; third, the jobber, the national assembler of merchandise and wares; fourth, the manufacturer, the maker of the millions of articles that the people must have.

While we obtain many benefits sufficient to justify us in maintaining our State and national organizations, yet if we shall obtain that which should be our highest ideal we can and must do it only through the service rendered others. Now, in consideration of these, the four factors with which we have to deal, volumes could be said, but I will not attempt to discuss this at length. But I may add that were it not for the assistance already rendered by the jobbers and many of the manufacturers we could not have accomplished the good already done. But in the distribution of the billions of dollars' worth of goods such as are handled by the Hardware trade, if we could succeed in building up an organization composed of manufacturers, jobbers and retailers, or of the various organizations working along broad lines, with the same object in view, namely, to fix the channels of trade and the methods of distribution, and each do our utmost to serve the purposes of the other, then we will prove that we have builded wisely our structure and will have achieved that which will ever bring order out of chaos and be of lasting benefit to mankind.

FREIGHT RATES.

Probably no subject in recent years has been so prominently before the public mind and so widely discussed as that of freight rates, and that this will in all probability remain one of the greatest issues before the people of our State and nation there is not much doubt, affecting as it does the price of every article of manufacture and agriculture produced by the toiling masses of the country, who constitute the consumers as well as the propelling forces of all the industries in our land.

That our organization and the various commercial organizations of this country must necessarily take the lead in contending for the rights of the people in the matter of freight rates comes from the fact that we are in daily contact with the railroads and are in a position to get at what portion of the cost of the various articles of merchandise constitutes freight and as to whether or not the railroads are getting more than their share for the service rendered.

AS A REMEDY FOR OUR TROUBLE

I think our association and various other commercial organizations should exercise their influence, to the end that we may be represented more largely in legislative affairs by men of commercial instead of legal training, men who are interested in the railroad service beyond that of their own transportation. Do not understand me to say that we have no good representatives who are lawyers, as some of the best and greatest men this country has ever produced belong to that profession, but they are human and the thing that appeals to them is that by which they profit most, just as it is to ourselves. Stop the issue of passes to our lawmakers, our lawyers, our constables, our justices and judges, and the retention of our lawyers for services never rendered and pay them in cold cash for their work, and see how soon there will be a reduction of the passenger rate in Arkansas and throughout the country. Now I would recommend that we either establish a freight bureau of our own, or, if thought best, make some arrangements by which we can be represented jointly with others in a central freight bureau, to the end that we may not only have some rate reform, but improvement in service as well.

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I do not know whether any of you have the trouble in service that we have. I know that the delays in transit of special orders as well as on regular goods cost our company several hundred dollars a year and much inconvenience and expense to our customers. As a little illustration of this will say that last year in February we shipped a lot of Sash Weights to Black Rock, a distance of about 45 miles. After waiting for some time for their arrival we shipped others by boat to take their place. Finally about August we were notified that they had arrived. Last fall we shipped some Gardner Governors to Oliphant or Grandglaise, about 9 miles distant from our town (Newport); at last accounts they had not yet arrived. About the same time we shipped to Batesville one Ash Pit Door. I inquired about it a few days ago, but it was not there. I mention these cases simply to illustrate the fact that we are not getting the service we are entitled to, and we need a remedy. How long would our business last if we rendered such service to our customers? I would recommend that every Hardware dealer in our association keep a book exclusively for the purpose, and when they receive a bill of lading for goods register the date shipped, who and where from, and the date of arrival at destination, and include in that the kind of goods and rate of freight paid. In this way we would accumulate records which would show both service and rate, and we could at stated times turn this over to our freight bureau, and if it became necessary could furnish them as evidence to the Interstate and State Commerce Commissions.

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I will mention a few items. From Memphis to Newport the carload rate on iron roofing for a distance of 116 miles is 10 cents and 20½ cents less than carload per 100 pounds. The same article from Newport to Newark, 15 miles, takes a rate of 10 cents per 100 pounds less than a carload, a distance of less than one-seventh of that from Memphis, and yet one-half the amount of Memphis charges. The local rate from St. Louis on the same is 31½ cents, a distance of 266 miles, against 10 cents from Newport to Newark, a distance of 15 miles.

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There has been so much discussion on this subject I feel that it would be impossible for me to add anything to what has already been said. However, I will say that I am satisfied we are gaining ground in our fight on this evil. We must be ever on the alert. All sorts of schemes will be adopted by them to offset our work. We are in this fight to win, and I want to say that the greatest advantage they have over us to-day is in the fact that they get cash for what they sell, while we Hardware dealers extend credit to their customers for goods

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Secretary-Treasurer's Report.

C. E. Taylor, Little Rock, made an encouraging report as secretary of the association, as follows:

The work of our association during the year just closed has been marked by progress that has been gratifying to those who have kept in touch with it. New members have been received, old ones retained, and a general association interest has been developed that augurs well for the future of our organization.

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I made inquiry from the National, Wisconsin, Minnesota and Iowa companies as to the amount of insurance they carry in our State and was surprised to learn that the totals were so small. Judge Pittman has a paper on this topic. He served one year as chairman of our Insurance Committee and believes in Hardware mutual insurance, and has shown his faith by his works in placing some of his insurance in the National and Minnesota companies. His paper is one that deserves our faithful consideration. The ability of members of this association to secure Hardware mutual fire insurance should be appreciated by our members.

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The credit rating system that has been established by the officers of the Retail Grocers' and Merchants' Association in Little Rock we feel confident has been of greater benefit to the retail merchants in this city than anything else that has been done for them, and I want especially to dwell upon this feature of association work. In this department of the work we aspire to be to the

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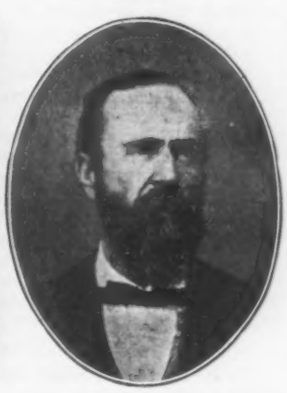

JNO. M. PITTMAN

retail merchant what Dun's and Bradstreet's agencies are to the wholesaler. The great majority of people in Little Rock pay their accounts, but we regret to say that there are some who don't, and the sooner the merchants find them out the better it will be for them and the merchants also.

The day has passed, long since, when a careful and conservative business man, be he Hardwareman, grocer, dry goodsman, druggist, baker, butcher, dairyman, milliner, plumber, insurance agent, vegetable vendor or any one else doing a credit business, or even a cash business, can successfully extend credit without first securing "a rating" of credit on his prospective customer. The credit

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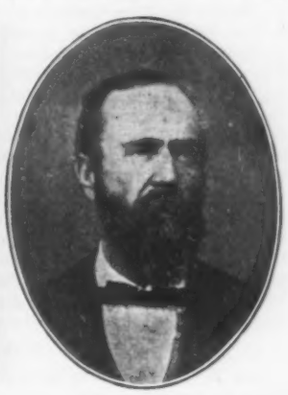

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WE TRY TO IMPRESS UPON OUR MEMBERS

that they must not be afraid of their customers and must ask prospective customers with whom they have never had an account for references at the time they apply for credit and after obtaining all the information possible give that information to us by telephone communication, and if we have not already a rating in the office on the party we proceed at once to get one from merchants with whom he has traded in the past. We use 3 x 5 cards, which are filed alphabetically, showing the information given by each firm, and this information is verified from time to time as inquiries are made by other members, so that the information is kept strictly up-to-date. In this way, getting information as we do from actual experience each merchant has had, you will readily see that the association does not make a man's rating, but he makes his own. They are the experiences from dealers who know what they are talking about, and prejudices, likes or dislikes, do not enter into our ratings at all.

The present rating system was begun in September, 1904, and we now have approximately

TEN THOUSAND CREDIT RATINGS ON FILE

in our office and they are being increased and added to every day. During the busy seasons of the year a careful record shows an average of fifty calls a day from our members for credit information. The effect of this system as it becomes generally known to the residents of the city will be to stimulate those who in the past have been inclined to abuse their credits and make them more prompt in their payments. Too many of us are inclined to live above our means, feeling that the merchant will wait patiently on us and what we don't pay this month we can pay next month. Next month we are in still deeper and the merchant is holding the bag. If a man knows that a record is being kept on the manner in which he treats his accounts it will have a good influence on him, and our merchants already feel the good effects of the credit rating system.

THE COLLECTION DEPARTMENT

is another important feature of the association work, although it is not the most important, as some members seem to think when we hear of them complaining to others because we have not been able to collect for them some trifling account against some deadbeat. We urge upon all our members to send their delinquent accounts to the association so that we may be informed as to who are delinquent and add the information to our credit records.

The association charges its members a fee of only 10 per cent. for making collections for them, and since this part of the work was begun our records show that we have collected for our members the sum of $3,671.52 during a period of 18 months, or an average of over $200 per month returned to members from accounts considered worthless. The usual charge of collecting agencies for handling such claims is 50 per cent., so we figure that on this basis we have saved our members in this department in round numbers about $1500. We do not employ a collector to present these bills, but we use a system of three form letters, the first very mild in tone and the others gradually growing stronger, calling the attention of the delinquent to the fact that it will not benefit his credit standing to have his name appear as such before a body of merchants such as our association represents. The method has been successful to a degree beyond our expectations and has the further advantage that usually the delinquent goes right into the store and makes settlement, and many instances have been called to my attention where delinquent customers have been made good cash customers by careful and judicious handling by the merchant at the time of settlement.

MUTUAL INSURANCE.

In March, 1905, after the Legislature had passed the famous antitrust law, which was destined to drive from our State many of the old line insurance companies, the officers and directors of our association thought it would be wise to organize a mutual fire insurance company in order that our members in this way might be aided in securing safe and adequate fire insurance protection. The Retail Merchants' Fire Insurance Association now doing business in this State was started by the officers and directors of the Merchants' Association. Our members have given us a share of their business, and we believe that a majority of them appreciate the spirit in which this company was organized and is being operated. Our company differs vastly from the other home companies in that we are doing a strictly cash business and are not accepting premium notes from any one. On this account our volume of business is smaller than it would be otherwise, but it is offset by the fact that we take only what might be termed a preferred class of risks. Our secretary is the only paid officer the company has and our expense of doing business is therefore very low. Quite a number of the members of the Hardware Association have policies in our company, and we appreciate their business and hope others will co-operate with us and help to build up this company.

Hardware Mutual Fire Insurance.

J. M. Pittman of Prescott read a paper on Hardware mutual fire insurance, in part as follows:

Experience has shown that Hardware mutual insurance is safe and sound, and is established on correct and sound business principles. It is one of the staple articles that is sold at actual cost. When any honest and fair minded man desires to purchase any article he is ready and willing to pay for a good one and to pay what it is worth. This is what is offered to you by all of the Hardware mutuals that have been brought to our attention.

The retail Hardware dealers were among the first to recognize the benefit to be obtained by mutual insurance. The nature of their business makes it less hazardous than any other line. They should, therefore, be put in a class by themselves, but as the old line companies have not seen proper to do so they have proceeded to organize companies themselves. Minnesota, Ohio, Pennsylvania, Iowa, Wisconsin, Missouri, and Nebraska all have well organized mutual companies in successful operation, and some of the other States are planning to do the same. One of the strongest and most substantial mutual companies is the National Retail Hardware Dealers' Mutual Fire Insurance Company, with headquarters at Huntingdon, Pa. It solicits business from all the States, but I think it insures only those who are members of some State association.

THE PLAN FOLLOWED

by the National and so far as I know by all of the State mutuals is to write policies for one year only, at the expiration of which time the insured knows to a certainty the amount of money the mutual has saved him. At the expiration of a policy the premium to which the insured is entitled is returned to him if he does not desire to renew his policy. If he renews it, it is credited on his renewal premium. The rate charged is the established board rate for the town in which the insured is located. The limit of insurance for any one risk fixed by the National and most of the State companies is $3000, and not more than $4000 in any one block. In this way disastrous fires are avoided, and this provision becomes an important factor of safety, lessening the chances of loss and thereby reducing the cost of insurance.

INSURANCE AT ACTUAL COST.

The mutual plan gives to every policy holder his insurance at actual cost. It is an absolutely safe investment. It is Hardware mutual insurance that insures. Every policy holder is fully protected and absolutely indemnified against loss. There are no favorites in these companies. The terms are alike to all and the benefits accrue to all alike. There can be no distinction or difference without destroying the mutual plan. All of our mutuals confine their business to the retail Hardware trade and write risks on no other lines, giving undoubted security and the most economical management at the very lowest possible cost.

These various mutual companies are saving for their patrons from 25 to 50 per cent., besides building up a surplus that will still further reduce premiums in the near future. This is not a question of doubt, but one of absolute certainty, as demonstrated by several years of actual test.

Let us all resolve to give more of our business to the mutual companies and by so doing help ourselves.

Selling Cook Stoves.

A paper was read by W. N. Brandon, Little Rock, representing the Phillips-Buttorff Mfg. Company, Nashville, Tenn., in which suggestions were given as to the sale of Cook Stoves. Mr. Brandon's paper was as follows, in part:

The stove question is one of vital importance to the Hardware dealer, for there is nothing more annoying to the housewife than an unsatisfactory cook stove, nor is there anything that will lose you a customer quicker. A dealer should if possible confine himself to one line of stoves and ranges. In doing so he proves to his trade that he has confidence in this line of goods. A salesman should be so familiar with the equipment of each Stove or Range that he knows it from the ground up.

THERE IS NO SUCCESS WITHOUT ADVERTISING,

but all advertising is not successful. First have something to advertise, get a list of all the householders in

your town and vicinity, then send them circulars, send them letters, send them prices, invite them to your store, advertise in the newspapers, keep your name before the public, sell good goods and get good prices. Keep something new continually before the trade, and get directly into the homes of the farmers, get out some advertising features that will interest the housewife, cook books, &c. Use the manufacturer; he is always ready and willing to assist you and give you his ideas of many years' experience and study. Many times the manufacturers send advertising matter to their customers, express charges prepaid, and instead of being properly distributed it goes under the counter, into the waste box, in alleys, &c. Under those conditions can you blame manufacturers for being slow in pushing the advertising matter on the customers? Advertising brings prospective customers to your store but does not sell the goods; it is then up to you.

YOU MUST FIRST SHOW

the prospective buyer that you have his interest at heart and that you are not merely trying to make a sale but a customer. One sale does not constitute a customer or build up a business, but a sale made in such a manner as to gain confidence does. When a customer enters your store door he should be greeted with a cordial smile of hospitality. This little courtesy has a remarkable effect; no one relishes entering a house where the welcome is not apparent. As soon as the salesman learns what is wanted he should show the cooking equipment desired, going to the exact Stove or Range to start with. If not satisfied as to what is wanted, do not show the best or cheapest article to begin with, but go to some neat medium priced piece of goods, for we ofttimes misjudge our customer. This information can frequently be obtained without boring the customer before reaching the Stove exhibit.

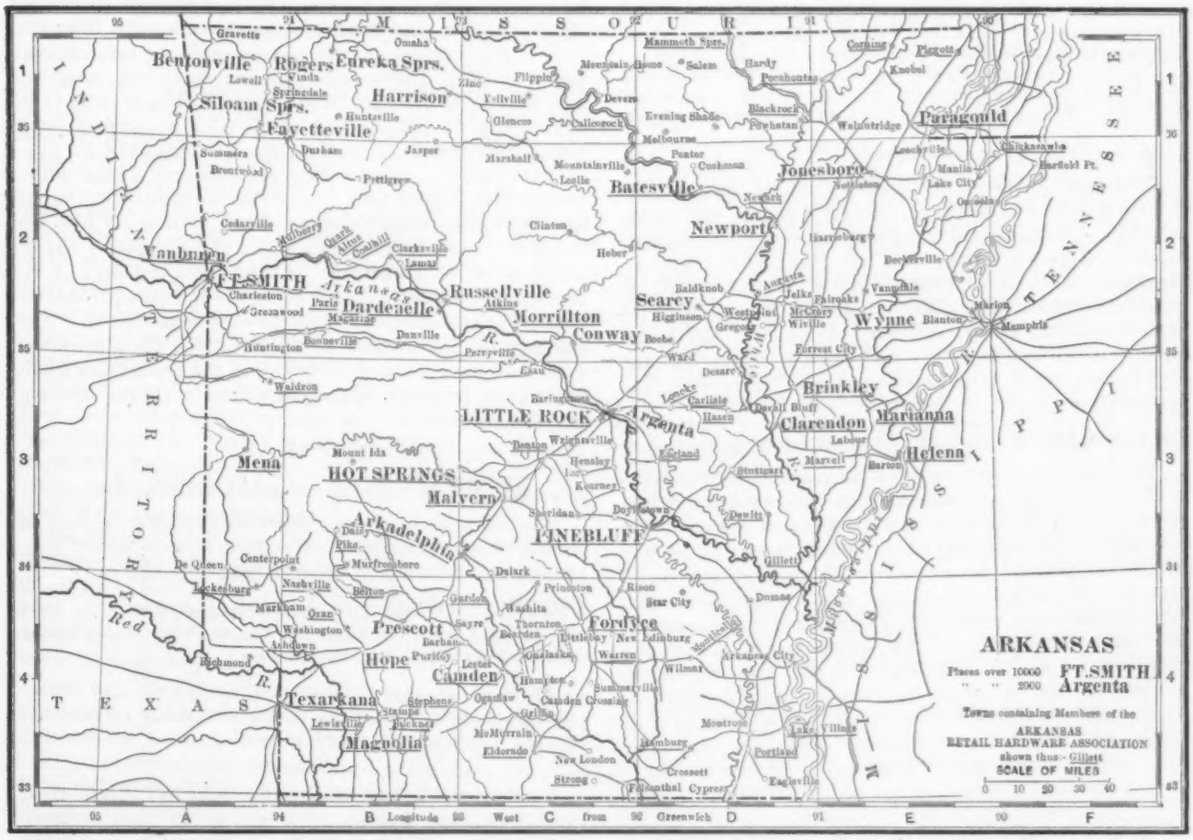
STOVES SHOULD BE NEATLY DISPLAYED

on a platform from 10 to 12 inches high. Stoves and Ranges should be kept nicely polished. On approaching the Stove, swing open the oven door, that is a matter of a moment, for the size of a capacious oven makes a most pleasing impression. Call attention to the general appearance of the Stove or Range, smoothness of casting, lustre of nickle work (if any), dimensions of fire box, size of feed door, the convenience of arrangement of loose hearth and outside shelf, if any, feeding capacity, tight fitting joints, show plate to be well molded and mounted. Take off the covers and cross pieces showing out long centers if any. Call attention to the ridge molding on bottom of the cover, giving rigidity and lessening warpage. Work in any other argument that occurs to you, keeping up a running fire of the advantages that particular Stove or Range possesses. Then you finally come to the subject of prices. Do not mention this until every other argument is set forth. While you may think they are interested in the cost of the Stove or Range, the truth is they want the best service for the price without regard to money involved.

WHEN THE WIFE WANTS ONE STOVE

and the husband another, take sides with the wife and at the same time use a little diplomacy in explaining to the husband that she is the one to use the Stove and should be pleased, or, in other words, have her choice.

A point of imperative importance is to follow up the Stove transaction after the sale is made. If possible to do so, have it set up by an experienced stove setter and demonstrate its service. Always urge that your customer advise you promptly if anything arises about the Stove or Range that is not fully understood, for a word or two in time may spare a disputed account or the baneful influence of a dissatisfied user. I consider this a superb investment even though some cost be incurred. To place a satisfactory Stove or Range is sowing a good seed and the soil upon cultivation will invariably bring forth good fruit manifold.



Hardware Association Map of Arkansas.

National Delegate's Report.

Hamp Williams of Hot Springs made an interesting report as the Arkansas Association's delegate to the meeting of the National Retail Hardware Association at Chicago in March last.

New Officers.

The following officials were elected for the ensuing year:

PRESIDENT, Emmett E. Mitchell, Morrilton.
FIRST VICE-PRESIDENT, Jos. L. Davis, Magnolia.
SECOND VICE-PRESIDENT, R. W. Meriwether, Paragould.
SECRETARY-TREASURER, C. E. Taylor, Little Rock.
EXECUTIVE COMMITTEE, for one year: Hamp Williams, Hot Springs; R. F. Roys, Russellville; J. P. Simpson, Malvern; T. J. Mott, Helena. For two years: Jno. M. Pittman, Prescott; Thos. B. Stewart, Newport; N. T. Richmond, Fort Smith.

Resolutions.

The committee on resolutions reported the following, which were adopted:

Resolved, That this association extends its thanks to the various railroads in the State for reductions in rates for this convention.

Resolved, That we thoroughly appreciate the courtesy and hospitality of our friends the traveling men who entertained the members of this association at the banquet and at the Forest Park Theater.

Resolved, That we extend our thanks for courtesies shown us by the following trade journals: *The Iron Age, Hardware Dealers' Magazine, Stoves and Hardware Reporter, Farm Machinery*, the *Tradesman, Hardware* and the *Iron and Machinery World*.

Resolved, That our thanks and appreciation be tendered *The Iron Age* for its special courtesies to our organization.

Resolved, That the thanks of this association be tendered M. L. Corey, secretary of the National Retail Hardware Association, for his valuable assistance rendered us at our meeting.

Resolved, That our thanks be extended to the various manufacturers and jobbers who made exhibits at our convention.

Resolved, That we show our appreciation of the advertising support given our 1906 programme, and we suggest that our members show their appreciation in a practical way of the support given our programme, as in making the programme a success they assist in defraying the expenses of this association.

Resolved, That our thanks be tendered the traveling men who are our associate members and who have done loyal and noble work during the year just closed in behalf of our association.

Banquet.

A banquet, tendered to the association by the Arkansas traveling men, was given at Gleason's Hotel on Tuesday evening. It was a most enjoyable occasion. Very entertaining addresses were made by Hon. Lewis Rhoton, toastmaster, W. N. Brandon, Jno. M. Lofton, Frank B. Gragg, Hamp Williams, Hon. Joseph M. Hill, Judge Pittman, and M. L. Corey, secretary of the National Retail Hardware Association. The addresses of Judge Hill and Mr. Lofton were listened to with special interest and appreciation.

HARDWARE ASSOCIATION MAP OF ARKANSAS.

Herewith we give a map of Arkansas, indicating the towns represented in the association membership a month since. It will be observed that all parts of the State are covered by the organization, although there are quite a number of places where the association is still unrepresented. Accessions during the convention, more than 30, have probably diminished the number of such towns. The total membership of the association is now in the neighborhood of 160. Referring to the map it will be understood that all places underscored contain members. Towns of over 10,000 population are in capitals, as Fort Smith, and 2000 to 10,000 in heavy face lower case type, as Argenta. Smaller places are in lower case roman.

OKLAHOMA AND INDIAN TERRITORY CONVENTION.

THROUGH information gathered by traveling men covering Oklahoma and Indian Territory, an unusually large attendance is anticipated at the annual convention of the Retail Hardware, Implement and Vehicle Dealers' Association of Indian and Oklahoma Territories at Oklahoma City, on July 10, 11 and 12. The association calls special attention to the fact that in connection with the meeting there will be an exhibit hall, in which space will be furnished free to manufacturers and jobbers for display of their goods. This exhibit hall is conveniently located and large enough, 150 x 175 feet, to accommodate quite a number of exhibits. First come first served is the principle followed in making reservations, which are being received almost daily, and it is expected that the demand will be greater than the supply of space.

THE POWERS PUBLISHING COMPANY, Norwalk, Ohio, has issued a catalogue of Hardware electrotypes which are designed for the use of the merchant in his local advertising, newspaper, catalogue, &c. The company states that it is now in a position to furnish the trade with electrotypes of nearly all Hardware articles, in addition to quite a number of special cuts of a pictorial character.

RUSSELL & ERWIN MFG. COMPANY OF NEW YORK.

THE business of the New York branch of the Russell & Erwin Mfg. Company was on June 8 incorporated under the laws of New York as the Russell & Erwin Mfg. Company of New York. This was to accomplish better and more satisfactory results in various ways and has been supplemented by numerous changes in the organization, which practically reorganizes the different departments and greatly strengthens their efficiency. The officers are as follows: Howard S. Hart, president; B. A. Hawley, first vice-president; I. D. Russell, second vice-president; J. H. Van Newkirk, treasurer and manager; W. H. Donaldson, assistant treasurer; W. A. Cherry, secretary, and C. C. Haselton, assistant secretary. The Board of Directors consists of the officers here named, together with William Browne, George E. Moore, William E. Diehl and O. P. Malone. The selling portion of the business of the business is entirely in charge of W. A. Cherry, who is responsible for all sales from the New York warehouse, and the contract department, assisted by W. E. Diehl, sales manager, S. C. Van Antwerp, assistant sales manager, and George E. Moore, who is in full charge of pricing and costs, with a corps of competent assistants. C. C. Haselton has charge of all buying, both of the Factory Line and General Merchandise, which has always been a part of the business. He is assisted by Mr. Saylor and Mr. Johns, with a corps of assistants. The office force is under the immediate supervision of W. H. Donaldson, who has entire charge of all invoicing, collections, etc., it being the intention to greatly improve and strengthen the invoice department. The business as now conducted is carried on by a seasoned force who have worked their way to the front from small beginnings, some of whom have been with the house a great many years.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM E. D. VAUT HARDWARE COMPANY, 115 Grove street, San Francisco, Cal., which has lately commenced business anew at the above address.

FROM BOOTHE-MAX HARDWARE COMPANY, 1602 West Pico street, Los Angeles, Cal., which has been incorporated with a capital of $6000. A general line of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods is carried. The company occupies a new store, with an entirely new stock of goods.

FROM J. D. FRENCH COMPANY, temporary address 2130 Sutter street, San Francisco, Cal., manufacturers' agent for Hardware, Metals, &c., who request catalogues and quotations relating to Builders' Hardware and Builders' Materials.

UNITED STATES HORSE SHOE COMPANY.

UNITED STATES HORSE SHOE COMPANY, Erie, Pa., whose plant was completed in March of last year, and whose Horse and Mule Shoes were first put on the market during the month following, has since that time been operating to its full capacity and during recent months has been obliged to enlarge the works to be in a position to take care of orders. The plant now consists of a mill building, 70 x 340 feet; machine shop, 30 x 60 feet; iron house, 30 x 100 feet, and warehouse 40 x 160 feet, all of steel construction, equipped with the most modern machinery, and having a capacity of 600 to 800 kegs of Shoes per day.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

J. H. WILLIAMS & Co., 150 Hamilton avenue and Richards street, Brooklyn, N. Y.: Catalogue relating to Iron, Steel, Copper, Bronze and Aluminum Drop Forgings, Drop Forged Wrenches, Tool Post Fittings, Crank Handles, Clamps, Lathe Dogs, Caliper Gauges, Eye Bolts, Hooks, Wire Rope Sockets, Shafting Collars, Crank Shafts, Levers, &c.

THE FEDERAL MFG. COMPANY, 162-172 West Long street, Columbus, Ohio: Catalogue devoted to Gas, Electric and Combination Fixtures; also Columbus Gas Arc Lamps. The company states that it is constantly increasing its line of Fixtures and Incandescent goods.

F. SMITH & SON, Clinton, Iowa: Catalogue and price-list No. 2, devoted to the Bull Dog Brand of Step and Extension Ladders. The firm has lately taken up the manufacture of Ironing Boards and Clothes Bars or Horses.

N. N. HILL BRASS COMPANY and WATROUS MFG. COMPANY, East Hampton, Conn.; branch of National Novelty Corporation, 826-828 Broadway, New York: Catalogues devoted to Bells for the Hardware and Saddlery trade; also Metal Toys.

FLEMING & SONS MFG. COMPANY, Huntsville, Mo.: Illustrated catalogue relating to Automatic Swinging Hay Stackers and Riding Hay Rakes.

THE WEST HAVEN MFG. COMPANY, West Haven, Conn., New York office, 155 Chambers street: Catalogue relating to Power Hack Saws, Hack Saw Blades and Frames, Plumbers' Hollow Mill Saws and Copper Hammers. The company has added several new sizes of Saw Blades to those formerly manufactured.

DE HAVEN MFG. COMPANY, 50-54 Columbian Heights, Brooklyn, N. Y.: Catalogue relating to Steel and Wire Specialties, Box Straps, Clutch Nails, Hoop Iron, Bale Ties, Hoop Fasteners, Seals, Furniture Staples, Metal Joint Fasteners, Bale Tie Snips, Meat Tag Fasteners, Metal Flower Rods, &c.

RHINELANDER MFG. COMPANY, Rhinelander, Wis.: Illustrated catalogue of Refrigerators, including the Rhinelander Cleanable, Rhinelander Grand and Oneida lines. The Grand Refrigerators are a new line, designed to be ranked among the best grades on the market. The company is also manufacturing a new Christmas Tree Holder.

ROGERS SCREW COMPANY, Providence, R. I.: Circular giving price-list of Improved Steel, Brass and Bronze Wood Screws.

THE S. FREEMAN & SONS MFG. COMPANY, Racine, Wis.: Catalogue No. 34, relating to Wind Mills, Towers, Feed and Ensilage Cutters, Horse Powers, Portable Steam Sawing Outfits, Tilting and Sliding Table Wood and Pole Saws, Corn Shellers, Grist, Bone and Feed Grinders, Fanning Mills, Broad Cast Sowers, &c.

IDEAL MFG. COMPANY, New Haven, Conn.: "Ideal hand book of useful information for Shooters," No. 17. New matter in the book includes information regarding reloading for high power or high velocity hunting rifles, fusion or gas cutting, reducing loads, hard bullet alloys, working up smokeless powder charges, metal gas check high powder cast bullets, bullet metal, &c.

EUREKA FENCE MFG. COMPANY, Richmond, Ind.: Catalogue relating to Field and Ornamental Fence, Gates, Umbrella Racks, Fence Machines, Revolving Chimney Tops, Steel Wire Reels, Earth Augers, Eave Trough Hangers, &c.

FRITZ & GOELDEL MFG. COMPANY, Grand Rapids, Mich.: Catalogue and price-list of Drafting Room and Office Furniture.

IMPERIAL BIT & SNAP COMPANY, Racine, Wis.: Catalogue and price-list No. 6 of Saddlery and Wagon Hardware, including Snaps, Buckles, Horse Bits, Third Carriage Seats, Spoke Holders, Tank Lugs, &c.

THE FERROSTEEL COMPANY, Cleveland, Ohio: Catalogue devoted to Warm Air Registers and Ventilators made of ferrosteel, modified steel and wrought steel.

THE HESS SPRING & AXLE COMPANY, Carthage, Ohio, and Pontiac, Mich.: Catalogue devoted to Axles, Springs, Wrought Scroll Shackles, &c. The company has been operating the Pontiac plant since September last.

WATERBURY-ZIMMER IMPLEMENT COMPANY, successor to Smith & Zimmer Company and Waterbury Implement Company, 240-244 Seventh avenue, South Minneapolis, Minn.: Illustrated catalogue and price-list devoted to Implements, Buggies and Wagons.

THE INTROSTILE & NOVELTY COMPANY, Marietta, Ohio: Circulars relating to the Introstile Threshold and the O.-K. Metal Weather Strip for door bottoms.

F. P. SMITH & Co., Sharon Hill, Pa.: Illustrated circular of Smithicks Pointed Belt Hooks.

DEMOREST MFG. COMPANY, Williamsport, Pa.: Catalogue descriptive of Drop Head and Box Top Sewing Machines; also circulars devoted to two new Drop Head Machines, Nos. 24 and 84.

PAGE WOVEN WIRE FENCE COMPANY, Adrian, Mich., and Monessen, Pa.: Catalogue relating to Coiled Spring Woven Wire Fencing, Wrought Iron Fencing, Farm Gates, Rods, Wire Staples, Wire Nails, Barb Wire and Rural Delivery Mail Boxes.

THE FROST WIRE FENCE COMPANY, Cleveland, Ohio, and Hamilton, Ont., Canada: Catalogue of Farm and Railway Fences, Coiled Spring Wire, Steel Farm and Lawn Gates, Soft Galvanized Wire, Barb Wire, Cable or Twist Wire and Fence Staples.

THE EDWARDS MFG. COMPANY, Cincinnati, Ohio: Booklet illustrating Metal Shingles, Hip Shingles, Crestings, Metal Fireproof Windows, &c.

W. C. TOLES COMPANY, Irving Park, Chicago, Ill.: Illustrated catalogue and price-list relating to Rapid Acting Vises for wood workers, shown in several styles for various purposes; also a line of Manual Training Benches for schools.

J. WYKE & Co., East Boston, Mass.: Price-list and descriptive catalogue of Machinists' Fine Tools, including Gauges of various kinds, End Measuring Combination Rules, &c.

PARAGON MFG. COMPANY, 541 Monadnock Block, Chicago, Ill.: Illustrated catalogue devoted to Revolving Cylinder Washing Machines.

THE SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio: The S. W. P., a pamphlet published monthly in the interest of the company's agents. The June issue is devoted largely to the San Francisco fire, including illustrations.

AVERY MFG. COMPANY, Peoria, Ill.: Catalogues relating to Engines, Threshers, Self Feeders, Pneumatic Straw Stackers, Water Tanks, Farm Machinery, Grain Weighers, Agricultural Implements, Farm Wagons, &c.

THE WHITMAN & BARNES MFG. COMPANY, Chicago, Ill.: Illustrated pamphlet relating to Tubular Frame Grindstones.

THE MILLER ANCHOR COMPANY, Norwalk, Ohio: Catalogue illustrating Anchors for pole and fence work.

ELWOOD LAWN MOWER MFG. COMPANY, Elwood, Ind.: Illustrated descriptive circular of four styles of Lawn Mowers.

WABASH SCREEN DOOR COMPANY, Marquette Building, Chicago, Ill.: Illustrated catalogue of Wire Glass, Glass, Enameled, Brass and Zinc Washboards.

THE MARKHAM AIR RIFLE COMPANY, Plymouth, Mich.: Catalogue illustrating Air Rifles, including the King, Queen Take Down and Chicago.

NEVERSLIP TIN COVER COMPANY, Watertown, N. Y.: Circulars devoted to Neverslip Pot Covers and Gifford's Galvanized Steel Plate Snow Shovels.

Hillsboro Hardware Company, Hillsboro, Ohio, has disposed of its stock of Hardware, Stoves, Implements, &c., and retired from business.

The Hardware Store of Neal & Brinker Company.

ELEVENTH ARTICLE.

THE accompanying diagram, Fig. 67, is a plan of the second floor of the Hardware store of Neal & Brinker Company, New York. Previous articles of this

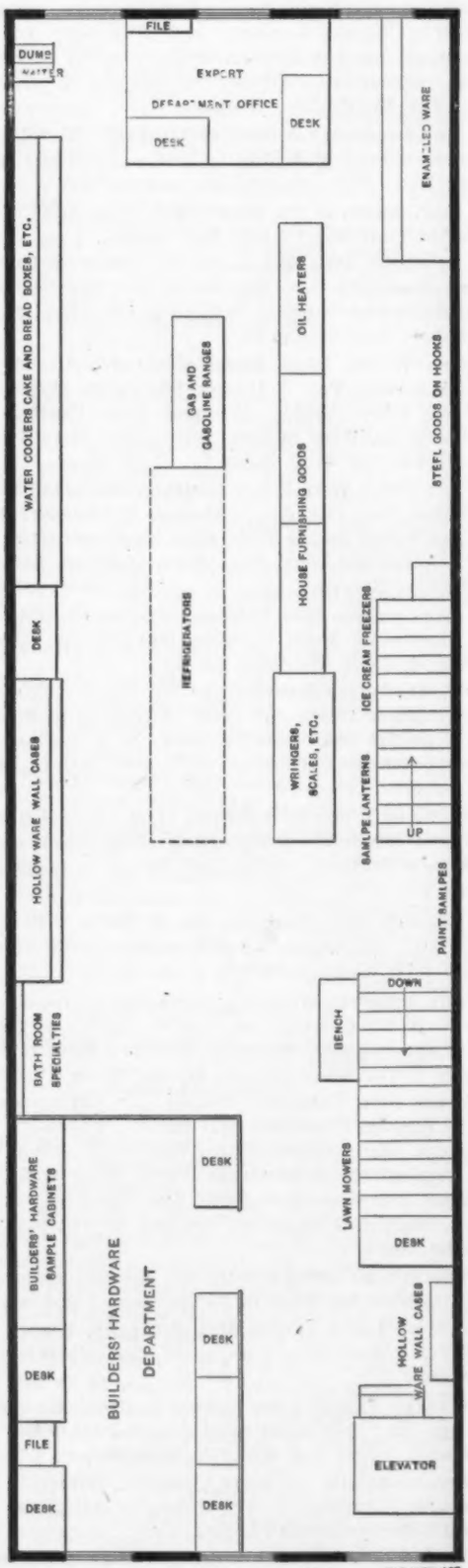


Fig. 67.—Plan of Second Floor.

series have contained plans of the first floor, basement and subcellar drawn on a similar scale. The second floor is used almost entirely as a sample room, supplementing the first floor, which is largely devoted to Shelf Hardware, and containing goods which require more room for display. Among these may be instanced Lawn Mowers, Ice Cream Freezers, Refrigerators, Wringers, Scales, Gas and Gasoline Ranges, Oil Heaters, Water Coolers, Cake and Bread Boxes, &c. Fig. 68 shows the method of accommodating samples and retail stock of Steel Goods, Shovels, Spades and Ice Tongs on this floor. They are

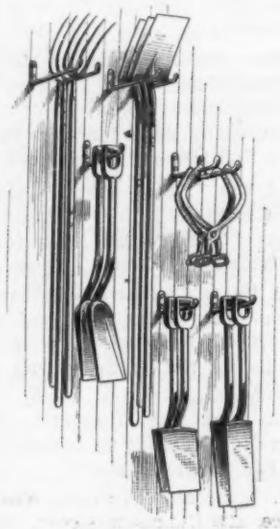


Fig. 68.—Forks, Shovels, Tongs, &c., Hung on Harness Hooks.

hung from Harness Hooks projecting from the side wall, single Hooks being used to hold short D-handle Tools and pairs of Hooks forming a rack for long, straight handle Tools, which are hung by the blades, as indicated. Ice Tongs are hung by their hook ends on two

Fig. 69.—Samples of Outdoor Bracket Lamps, Lanterns, &c.

Harness Hooks of equal hight, set far enough apart so that the Tongs remain approximately in the closed position. Fig. 69 shows samples of outdoor Bracket Lamps, Lanterns, &c., grouped together on the side wall of the second floor. The Brackets are held in place by Screws, as in actual use, while the Lanterns of various designs and sizes hang by their bails on Harness Hooks.

The Builders' Hardware Department, which occupies the front end of the second floor, is exceptionally well arranged, containing desks for members of the department, large sample cabinet, &c., and affording well lighted space where trims may be shown, plans and specifications examined and estimates figured without the attention of salesman or customer being diverted by other matters. The sample cabinet is illustrated in Fig. 70. It consists of a long case, divided into compartments of different widths, with slides to accommodate the sample boards, most of which are devoted to complete sets of the same design and finish. On some boards, however, several different samples of the same article are shown. Many boards have convenient easel frames, as indicated in the cut, so that it is possible to stand them

Fig. 70.—Sample Cabinet of Builders' Hardware.

up in an effective way on the counter base or on the sliding shelves, fitted with drawer knobs, shown in the illustration. The cabinet has what may be described as a sideboard back, affording additional shelving, on which samples may be displayed and compared.

(To be continued.)

AMONG THE HARDWARE TRADE.

The Hardware, Stove, Furniture and Sporting Goods business of W. R. Holmes, Cotesfield, Neb., has been bought by E. S. Sears.

Joseph Matousek, Anton Hurt and J. J. Langer have incorporated the Solingen Cutlery Company, at Lincoln, Neb., with a capitalization of $50,000. The company will conduct a wholesale business in general Cutlery.

E. C. Breese has succeeded W. S. Lee in the retail Hardware business in Weston, Mich.

J. L. McKenzie, Howesville, W. Va., has retired from business.

J. C. Zinser, Oregon City, Ore., has sold his Hardware store to J. E. Smith.

Orlando Hardware & Implement Company, Orlando, Okla., has been incorporated, with a capital of $5,000.

The retail Hardware business of Teague Mercantile Company, Du Quoin, Ill., has been purchased by Keith & Lipe.

The Hardware store of E. S. De Cow, Sandusky, Mich., has been slightly damaged by fire.

The Monarch Hardware Co. is closing out its stock in Provo, Utah, and will consolidate its business in its Salt Lake store.

Salem Hardware Company, Salem, O., has increased its capital from $20,000 to $40,000.

F. A. Amsberry has engaged in the retail Hardware, Stove and Tinware business in Mason City, Neb.

The firm of Bliss & Compson, Clyde, N. Y., has dissolved, being succeeded by Geo. S. Bliss.

Otto Agricola, Hardware, Stoves, Tinware and Crockery, Gadsden, Ala., has removed from 435 to 429 and 431 Broad street. This gives just double the floor space previously occupied. Mr. Agricola has also taken a warehouse 50 x 80 feet, two stories, with railroad frontage.

De Bolt & McCann, Coulee City, Wash., have been succeeded by Smith & McCann.

K. Fitch & Co., Kansas City, Mo., have sold their Hardware, Stove, Tinware and jobbing business to Kinney Hardware & Mfg. Company, who will continue at the old stand.

The Hardware, Stove, Paint and Sporting Goods business of A. J. Bollinger, St. Paul, Neb., has been purchased by Ward & Peterson.

The Hardware store of Frank Kellogg, La Harpe, Iowa, has been bought by Roderick & Kilgore.

L. Bouquot has purchased the Hardware, Stove and Paint business of L. E. Lincoln, Curtis, Okla.

J. H. Vogel has succeeded to the Hardware business of J. H. Vogel & Co., Stuttgart, Kan.

Fred J. Ellwein has purchased the interest of J. J. Bowen in the firm of Bowen & Smith, Bridgewater, S. D. The business is now conducted by Smith & Ellwein, who carry Shelf and Heavy Hardware, Stoves, Tinware, Paints and Oils.

Troutman & Hyams have opened a new Hardware store in Marion, N. C., and will conduct a wholesale and retail business.

Matney & McConnell have purchased the business of Marshall Bros., in Muskogee, I. T., and will carry a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Paints and Oils.

Robinson & Terrall have succeeded Robinson Bros. in the Hardware business in Reinbeck, Iowa, and will carry Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, Furniture and Undertaking Goods.

Corn & Brewer have purchased the Hardware and Implement business of C. S. Watson in Salt Fork, Okla., and will continue the business with the addition of groceries.

The Sedgwick Hardware Company has purchased the store of Isaac W. Wallace, Sedgwick, Col.

F. M. Achauer & Co. have succeeded to the Hardware business of Achauer & Reynolds in Lock Springs, Mo.

MISCELLANEOUS NOTES.

Hutchins Roller Swing Company.

Hutchins Roller Swing Company, Alton, Ill., is manufacturing a porch or lawn swing, consisting of a stationary lower platform with steel concave tracks on each end, on which is placed the foot platform hung on flanged wheels. On the wheels is placed the upper platform carrying two double seats. This platform has at each corner a convex steel track which rides upon the circumference of the flanged wheels of the foot platform, giving it an easy motion like the ball bearings on a bicycle. The operation of the swing is entirely obtained with the feet, leaving the hands free. In addition to a canopy top three attachments are provided, consisting of a table, fan and hammock attachment. Every piece of the swing is thoroughly bolted, the seat slats being

bolted to angle steel frame pieces. The swing is constructed of oak and yellow pine, with good quality of steel, painted in red and black, and can easily be taken apart for shipping.

Gifford's Galvanized Steel Plate Snow Shovel.

Neverslip Tin Cover Company, Watertown, N. Y., has strengthened the blade of its Gifford's galvanized steel plate snow shovel by putting in some extra corrugations, making it more rigid than before and consequently firmer on the handle. Steel points are attached with slight improvements, making that part of the shovel more rigid than heretofore. The shovel, as it will appear on the market the coming season, will surpass in strength, durability and appearance all of the company's previous efforts.

Portable Stand or Movable Bench.

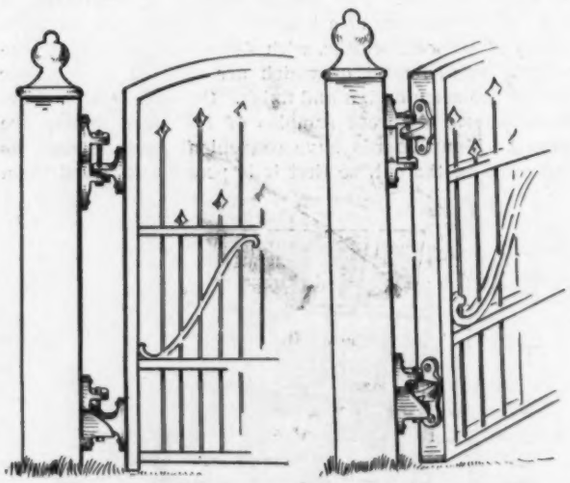
The Western Tool & Manufacturing Company, Springfield, Ohio, is offering the portable stand or movable bench illustrated herewith. It is 40 inches high, with shelves 22 x 24 inches in size and weighs 300 pounds. It is designed to take the place of the ordinary stationary bench, and occupies a small amount of floor space. The stand

Portable Stand or Movable Bench.

is made heavy enough for any load. In this way the day's work and tools can be moved to the lathe or planer or elsewhere, saving time, as the men are kept right at work. When the handle is upright, as shown in the cut, the bench rests solidly and immovably on the floor, but when pulled forward it throws the front wheel into operation and releases the brake from the rear wheel.

The American Gate Hinge.

The accompanying cuts show a gravity hinge which can be put on any front gate. The hinge keeps the gate closed when at rest, as the weight of the gate does the closing. When the gate is pushed open it travels up an incline on the hinge nearest the bottom of the gate, and when released it travels down again to the lowest point, closing the gate. The gate parts of the hinge are held in the post parts by regular ⅝-inch machine bolts with threads and nuts. The shape of the hinges makes them strong, and the avoidance of the use of a spring greatly increases the life of the hinge. Attention is directed to the lifting of the gate when opening as a good feature, in case the post should sag, or in case there is snow on the ground or too much gravel or stones. The lifting of the gate also changes the place of friction to different points, thereby increasing the life of the hinge. The hinge is noiseless and the gate will open to a right angle with the fence either way. The hinge is manufactured by the American Gate Hinge Company, Provo City, Utah. The company also makes an automatic hinge for drive gates which is operated from



The American Gate Hinge, Showing Gate Closed and Open.

the vehicle without the driver descending from his seat. The hinge also allows the gate to open both ways and always away from the approaching vehicle.

The Miller Fence Post Anchor.

The Miller Anchor Company, Norwalk, Ohio, is offering the anchor for wire fence work shown in the accompanying cuts. The anchor is 6 x 13 inches in size and is fitted with a ½-inch rod, 7 feet long. A rod of this

Fig. 1.—The Miller Fence Post Anchor.

size will stand a strain of 9800 pounds, according to actual test. In Fig. 2 the anchor is shown in use on the second post of a fence. The anchor can be put on the first post instead of the second and do away with the

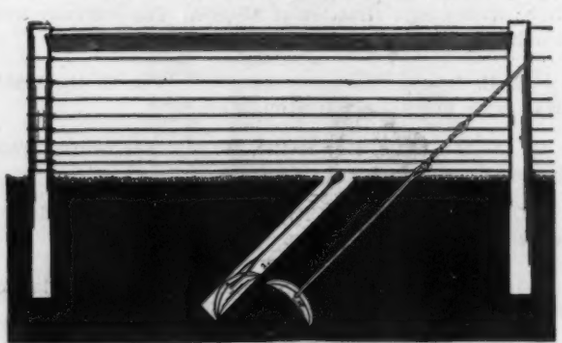


Fig. 2.—The Miller Anchor in Use.

brace where the anchor will not be in the way. For gateways, &c., the anchor is used on the second post. The unattached anchor in Fig. 2 illustrates the manner in which the anchor is put in the ground. An auger with adjustable blades, provided by the company, bores a hole from 6 to 8 inches in diameter, 6 feet deep. The anchor is put in the auger hole, and when drawn back assumes a position across the hole. Anchors of larger sizes are made for attaching to guy rods, for use in connection with trolley, telegraph and telephone poles, &c.

Silk Pneumatic Golf Ball.

The Goodyear Tire Rubber Company, Akron, Ohio, the sole Eastern representatives of which are Lee & Underhill, 35 Warren street, New York, is just putting on the market the silk pneumatic golf ball here illustrated. Fig. 1 shows it with its outer bramble pattern, similar to

Fig. 1.—Silk Pneumatic Golf Ball.

other golf balls, actual size. Fig. 2 represents one of the balls bisected, showing the general character of the various walls and the relation of each to the other. The interior lining is of gelatine, the next layer is fine Para rubber, which is then wound with the most expensive fine spun silk thread, it is said, round and round the air-tight composition which forms the inner wall of the pneumatic ball. The thin outer cover is of pure Para rubber,

Fig. 2.—Ball Bisected, Showing Construction of Walls.

which, the company asserts, it is impossible to gash or otherwise mar. After the ball is made air is forced into it to a pressure of 1200 pounds per square inch, making it very resilient and practically indestructible, it is claimed. Another statement made is that the resiliency of the silk pneumatic golf ball decreases consistently as the force of the stroke lessens, and in putting it can be given sufficient speed to maintain direction and surely reach the hole.

Fig. 3.—Windings of Spun Silk Before Outer Covering is Put On.

On account of the immense internal pressure, exactly the same in every direction, the ball does not lose its shape, maintaining the flexible silk wall and rubber cover a perfect sphere, even after months of play. The company backs these strong statements with a guarantee that if after a reasonable test the user is not satisfied to keep the balls they can be returned to the manufacturer, charge collect, and money will be refunded without question, every dealer being authorized to make the same proposition on the silk pneumatic. In this ball the liveliness or resiliency is graded from drive to put, lessening automatically as the force of the blow diminishes.

Exacto Packing Gauge and Cutter.

Greene, Tweed & Co., 109 Duane street, New York, are marketing the Exacto packing gauge and cutter, here illustrated. With this device the engineer, merchant or other individual can quickly, easily and exactly cut from continuous length packings just the length of material wanted, first getting the diameter of the rod to be packed. Thus a perfect fit is assured, cut from bulk material of the user's own choice as best adapted for a particular purpose, instead of through force of circumstances being compelled to use a cut packing in ring form that may be available. In operation the dial, Fig. 2, is set at whatever figure represents the diameter of rod to be packed, plus the diameter of the packing to be cut, a set screw

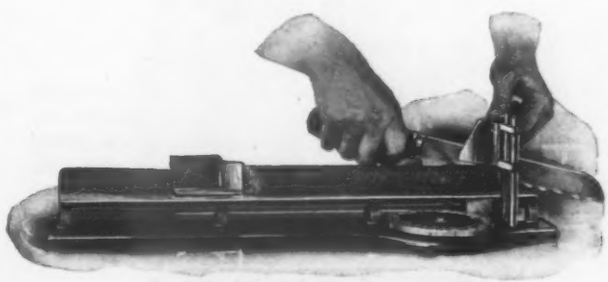


Fig. 1.—Exacto Packing Gauge and Cutter in Operation.

securing the stop in place. If, for example, the rod is 2 inches in diameter and the packing 1 inch diameter the dial is set at 3. The free end of the packing having been cut to the proper bevel in the gauge, it is then passed into the machine until the beveled end fits snugly into the stop. Then with the left thumb the knife guide is pressed down rigidly, holding the packing in place, and with a serrated edge knife inserted in the guide the cut is made, as shown in Fig. 1. This process produces a ring with the ends accurately feruled to make a close, clean cut lap joint, which, if reasonable care is exercised, will without calculation exactly fit the rod. All the rings

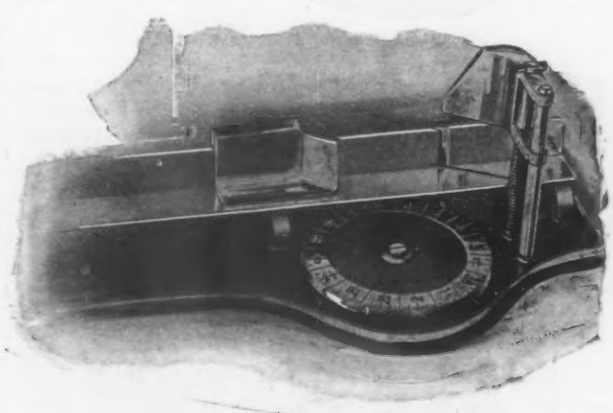


Fig. 2.—Enlarged View of Principal Working Parts.

cut to this measure will be exactly of the same size, thus avoiding waste from error in cutting, loss of time in fitting packing to rod, and if good material is used the manufacturers assure a tight joint and a workmanlike job. The machine is 19½ inches long, dial 4 inches in diameter and its greatest width is 5¼ inches. It will gauge and cut round, square or oval packings up to 1⅛ inches diameter. The manufacturers offer to send to any engineer one of the cutters for a 10 days' trial at $6 net (listed at $10), and if it does not prove satisfactory it may be returned and no charge whatever made.

Paragon Cylinder Washer.

Paragon Mfg. Company, 541 Monadnock Block, Chicago, Ill., is offering the washing machine herewith illustrated. In Fig. 1 the washer is broken away to show the action

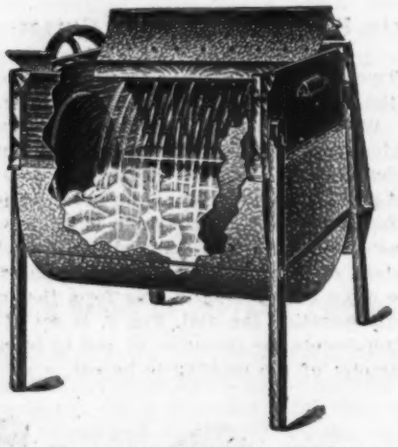


Fig. 1.—Paragon Cylinder Washer.

of the water. As the cylinder revolves the cross ribs carry the wet clothes upward and drop them rapidly and forcibly back into the water. The garments are tossed and tumbled in the moving hot water, while the soap suds and steam, which are forced again and again through the fiber of the fabrics, clean the clothes quickly without injury. The entire tub, the whole perforated circum-

Fig. 2.—Cylinder of Paragon Washer.

ference of the cylinder and the cover, are made of a fine grade of galvanized steel. The metal construction eliminates disagreeable odors. The exterior of the cylinder is shown in Fig. 2. The ribs and side walls are smoothly finished to guard against wear and tear of the clothes being washed. Strong and heavy catches are used to

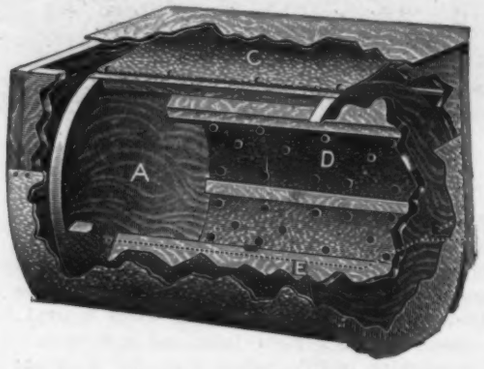
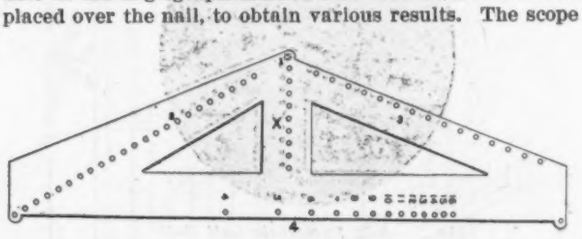


Fig. 3.—Inside View of Paragon Cylinder.

prevent the door opening when the cylinder is revolving. In Fig. 3 A represents the inside of the revolving cylinder, C shows the cylinder cover laid back, D indicates the perforations in the cylinder covering and E represents the position of the cross ribs in the cylinder frame.

The Anglegraph.

The Cassady-Fairbank Mfg. Company, 6106-6130 La Salle street, Chicago, Ill., is offering the anglegraph, an aid in drawing, shown herewith. It is made of light nickel plated steel, well finished, and is practically indestructible. In use a small nail or brad is driven through a drawing board from the under side, so that it projects about ¼ inch above the upper surface of the board. The drawing paper is centered and pressed down, so that the nail protrudes through the paper. The hole in the anglegraph marked 1 is used as a center and placed over the nail, to obtain various results. The scope



The Anglegraph.

of the device varies from the most difficult mechanical drawing in higher mathematics to the simplest designs of kindergarten work. It adapts itself readily to all classes of university, school and college work and quickly accomplishes, it is explained, everything that is possible for the most costly instruments. It is pointed out that with the device any one can make and accurately divide circles into any desired number of parts or degrees, square a circle, make geometrical figures of unlimited shapes, and do the work in one-quarter of the time required by ordinary rule and compass. It is recommended for the use of architects, designers of wall paper, hardwood floors, mosaics, stained glass effects, &c. It will also furnish amusement for boys and girls.

Mrs. Hutchins' Strainer Spoon.

The strainer spoon shown herewith is designed for skimming off the scum which continually arises on jellies,

Fig. 1.—Mrs. Hutchins' Strainer Spoon.

preserves and soups when cooking. It is also used for poaching eggs and whipping cream. It has all the uses of a strainer or skimmer and the convenience of a spoon. A screen wire is set into the bowl of the spoon to serve

Fig. 2.—Display Rack of Strainer Spoons.

these purposes. The spoon is 12 inches long, with metal parts retinned. In Fig. 2 is shown a display rack holding one dozen spoons. The device is offered by C. K. Hutchins Comnany, Buffalo, N. Y.

Sargent's Union Lock Sets.

Sargent & Co., New Haven, Conn., and 149-153 Leonard street, New York, have recently put on the market Sargent's Union lock set, two views of which are here illustrated. This set is a combination of lock, knobs and escutcheons, embodying a complete equipment for both sides of a door, ready for installation. An important

indorsement of this method of construction is the approval of the New York Fire Exchange, when used with the Richardson seamless fireproof doors, whereby the lowest minimum standard rate of insurance is secured. When so used the latch bolt is made with a center antifriction attachment and has a throw of ¾ inch, thus securing greater resistance and less liability of the door being forced open through warping under fire pressure. The lock sets are suitable for various kinds of doors, including front and vestibule doors, for which the house says they are just as satisfactory. Stress is laid on the ease and rapidity with which the lock set can be applied, the parts for the two sides being quickly clamped together, forming a solid lock with all the necessary trimmings. The door is not weakened by having much of it cut away, only four holes bored with a ⅞-inch bit and a few cuts with a chisel being necessary, while the mode of application increases the strength of both lock and door. The wrought steel working parts are machine made and exactly uniform in size, will not easily break and cannot fall apart or get out of position. These parts are also on the inside of the door, so that they cannot be reached from the outside. The five-pin tumbler cylinder above the knob allows of a one-piece cast knob and places the key mechanism inside the door, where it cannot be wrenched off or tampered with. The latch bolt is of the hinged type, sometimes called swinging or car latch, and is easy in action, operating with little friction. The knobs, cast in one piece, cannot come apart; they are self-adjusting, fitted with screwless spindles and securely fastened, so that they cannot be stolen and will not rattle or come off. This lock set can be furnished to order in sets of any required number, with nickel plated steel master key to pass each set and a grand master key to pass all. They can also be master keyed in sets with any Sargent cylinder door lock or latch, screen door latch or padlock. Each lock set is packed in a box complete and without any loose parts, and is adjustable for doors from 1⅝ to 2¾ inches thick. The various details of this set are exhaustively illustrated and described in a 12-page pamphlet for pasting into main catalogues, which is also supplemented by a stiff paper illustrated template for carpenters' use in fitting lock, showing exactly without measurement where to bore the necessary holes and how to mortise slightly one side of door.

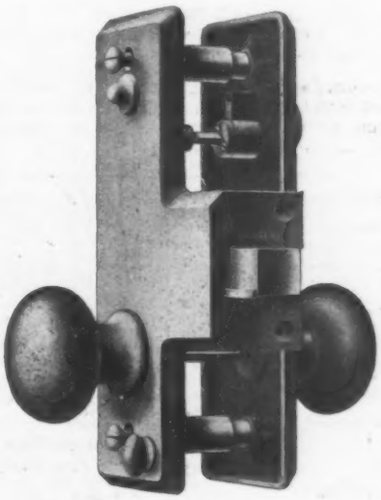


Fig. 1.—Sargent's Union Lock Set.

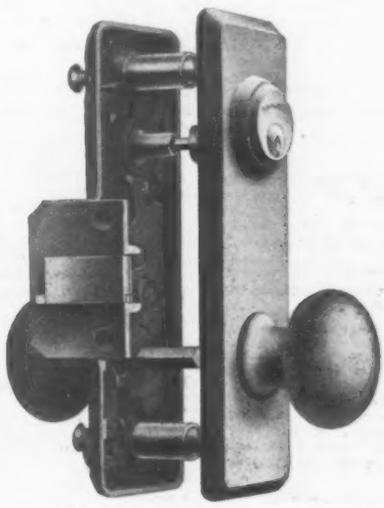


Fig. 2.—Showing Key Cylinder Side.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.	
Linseed, City, raw		40 @41
City, Boiled		41 @42
State and Western, raw		36 @38
Raw Calcutta Seed		68 @..
Lard, Extra Prime, Winter		71 @72
Extra No. 1		52 @53
No. 1		42 @44
Cotton-seed, Crude, f.o.b. mills		30 @30½
Summer Yellow, Prime		37½@38
Summer Yellow, off grades		36 @36½
Sperm, Crude		55 @..
Natural Spring		@..
Bleached Spring		@..
Natural Winter		63 @65
Bleached Winter		66 @67
Bleached Winter, Extra		68 @69
Tallow, Prime		51 @53
Whale, Crude		32 @33
Natural Winter		42 @44
Bleached Winter		44 @46
Extra Bleached Winter		46 @50
Menhaden, Brown, Strained		26 @29
Light, Strained		27 @30
Bleached, Winter		@..
Extra Bleached, Winter		@..
Southern		@..
Cocoanut, Ceylon	℔	6¾@ 7
Cochin	℔	8 @ 8¼
Cod, Domestic, Prime		36 @31
Newfoundland		35 @37
Red, Elaine		37 @40
Red, Saponified	℔	4¾@ 5
Olive, Italian, bbls		57 @60
Neatsfoot, prime		48 @49
Palm, Logos	℔	6 @ 6¼

Mineral Oils—

Black, 29 gravity, 25@30 cold test	℔ gal.	10½@11½
29 gravity, 15 cold test		11½@12½
Summer		10½@11½
Cylinder, light filtered		18 @19
Dark filtered		16 @17
Paraffine, 903-907 gravity		13½@14
903 gravity		12½@13
883 gravity		10¼@10¾
Red		12½@14

In small lots ½¢ advance.

Miscellaneous—

Barytes:		
White, Foreign	℔ ton	$17.50@19.00
Amer. floated	℔ ton	19.00@.....
Off color, No. 2	℔ ton	13.50@15.00
Chalk, in bulk	℔ ton	3.00@ 3.25
In bbls	℔ 100 lb	....@ .35
China Clay, English	℔ ton	12.00@17.00
Cobalt, Oxide	℔ 100 lb	2.50@ 2.60
Whiting, Common	℔ 100 lb	.43@ .48
Gilders	℔ 100 lb	.50@ .55
Ex. Gilders	℔ 100 lb	.55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls	60@60½
In machine bbls	60½@61

Glue—

	℔	lb
Cabinet		11 @15
Common Bone		7 @ 9
Extra White		18 @24
Foot Stock, White		11 @14
Foot Stock, Brown		8 @11
German Hide		12 @18
French		10 @40
Irish		13 @16
Low Grade		9 @12
Medium White		14 @17

Gum Shellac—

	℔	lb
Bleached Commercial		@41
Bone Dried		@61
Button		10 @50
Diamond I		54 @55
Fine Orange		48 @50
A. C. Garnet		@45
D. C		56 @60
Octagon B		@32
T. N		44½@45½
V. S. O		54 @55

Colors in Oil—

	℔	lb
Black, Lampblack		12 @14
Blue, Chinese		36 @46
Blue, Prussian		32 @36
Blue, Ultramarine		13 @16
Brown, Vandyke		14 @14
Green, Chrome		12 @16
Green, Paris		@24
Sienna, Raw		12 @15
Sienna, Burnt		12 @15
Umber, Raw		11 @14
Umber, Burnt		11 @14

White Lead, Zinc, &c.—

	℔	lb
Lead, English white, in Oil		9½@ 9¾
Lead, American white, in Oil:		
Lots of 500 lb or over		@ 7¼
Lots less than 500 lb		@ 7¾
In Barrels		@ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price		@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price		@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price		@ 1½

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2½ for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔	lb
Lead, White, Dry, in bbls		@ 6¾
Zinc, American, dry		4½@ 5

Zinc, French:

Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10½
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10½

Zinc, V. M. French, in Poppy Oil:

Green Seal:

Lots of 1 ton and over	12¾@13¼
Lots of less than 1 ton	12¾@13¾

Zinc, V. M. French, in Poppy Oil:

Red Seal:

Lots of 1 ton and over	11¾@11¾
Lots of less than 1 ton	11¾@12¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔	lb
Black, Carbon		5 @10
Black Drop, American		4 @ 6
Black Drop, English		5 @15
Black, Ivory		16 @20
Lamp, Com		4½@ 6
Blue, Celestial		4 @ 6
Blue, Chinese		29 @32
Blue, Prussian		27 @30
Blue, Ultramarine		4½@15
Brown, Spanish		½@ 1
Carmine, No. 40		$3.10@3.20
Green, Chrome, ordinary		3½@ 6
Green, Chrome, pure		17 @25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
Litharge, American, bbls	@ 7¼
Ocher, American	℔ ton $8.50@16.00
American Golden	2½@ 3½
French	1¼@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer	℔ 100 lb $0.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 6½
American, Raw	1½@ 2
American Burnt and Pow	1½@ 2
Talc, French	℔ ton $15.00@30.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb 90 @1.00
English	℔ 100 lb 80 @1.00
American	℔ 100 lb, No. 1, 75 @80
American	℔ 100 lb, No. 2, 60 @65
Umber, T'key, Bnt. & Pow	2½@ 3½
Turkey, Raw and Powdered	2½@ 3½
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome	12 @14
Vermilion, American Lead	10 @25
Quicksilver, bulk	65 @70
Quicksilver, bags	@61
English, Import	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list...25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $36; No. 2, $18.....60%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered..gro.63¢@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3¼¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$3.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...5¼@5¾¢
No. 1½ Com., New Style5¾@6¼¢
No. 2 Solid Collar.....4¾@5½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼¢

Towel

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 1, Jap'd, $1.20; No. 1, Tin'd, $1.50; No. B, Jap'd, $2.00; No. 2, Tin'd, $2.25.
Lyon, Jap'd, per doz., No. 2, $1.25; No. 3, $1.50.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. Co.)..℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch.. 6 7 8 9 10
Doz...$4.75 5.70 6.65 7.60 8.85

Molders—

Inch.. 9 10 11 12 14
Doz...$8.00 9.00 10.50 12.50 14.50

Net Prices.

Bells—Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....30%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished Brass.60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&67½%
Cone's Globe Hand Bells.....33⅓@33⅓%
Silver Chime.....33⅓@33⅓%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 15%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1906 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty. Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle, $3.00 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅝ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch..... 3 4 5 6 8
Per doz. $0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz..... $1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz..... $1.00 1.40 1.85
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz..... $0.75 .95 1.25
Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square 66⅔ & 10@66⅔ & 10&10%
Iyes' Patent Door.....60%

Plow and Stove—

Plow .....65&10@—%
Stove .....87½&10@—%

Tire—

Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz...$4.80 5.60 6.40 8.00
Inch..... 2¼ 2½
Per doz.....$5.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each...25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.: Nos. 210 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart	12	14
Water, Regular	*1.40*	*1.70*	*1.90*
Water, Heavy	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, list, Sept., '96..15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Discount.
Reversible and Broad..75&5%
Light Reversible, Light Narrow .....75&10%
Loose Joint, Narrow, L't Inside Blind, etc.....75%
Back Flaps, Table, Chest. .....70&10%

Extra, Ind. List.

Cages, Bird—

Hendryx Brass: Series 3000, 5000 1100, 5%; 1200, 33⅓%; 200, 300, 600 900 .....40&10%
Hendryx Bronze: Series 700, 800 .....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4½¢
Sharp, 1 prong...per lb. 4½@5¢
Burke's Blunt, 4@4¼ ¢; Sharp, 4½@4¾ ¢

Gautier, Blunt, 4@4¼¢; Sharp. 4½@4¾¢
Perkins', Blunt, ₱ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
*Primed Shells and Bullets.*15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$3.70	5.90	4.95	4.20	4.05	3.95	3.90

⅝	¾	⅞ to 1	1⅛ to 1¼ inch.
$3.85	3.70	3.65	3.80

German Coil.....60&10&10@70%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Covert Mfg. Co.
Halter.....35&5%
Covert's Saddlery Works
Halter.....70%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, *Str'ght, with ring*..$25.00
6½—6-2, *Str'ght, with ring*..$26.00
6½—8-2, *Str'ght, with ring*..$30.00
6½—10-2, *Str'ght, with ring*..$35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....60&10%
Safety Chain.....70&10%
Gal. Pump Chain.....lb. 4@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Covert Sad. Works:
Breast, Hold Back, Rein.....70%
Oneida Community:
Am. Dog Leads and Kennel Chains.....40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 38@40¢
Carpenters' Red.....gro. 33@35¢
Carpenters' White....gro. 28@30¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$34.00
Russwin.....40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List..75&10@75&10&5%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
L. & I. J. White.....30@20&5%
L. & I. J. White, Tanged.....25&5%

Tanged—

Tanged Firmers.....33 1-3@40%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%

Cold—

	lb.
Cold Chisels, good quality	.13@15¢
Cold Chisels, fair quality	.11@12¢
Cold Chisels, ordinary	9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck....35%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks....40&10%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive.....33⅓%
Planer Chucks.....30%
Face Plate Jaws.....40&10%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.40%
Independent Steel, No. 61.....30%
Union Czar Drill, Nos. 000, 101, 103.....35%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....35%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
'98 Chicago Horse, each....$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..35.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
} 20%

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70@—%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double, 65%; Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....75%

Conductor Pipe,—

L. C. L. to Dealers:

Territory:	*Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	70&10%	60&7½%	40&10%
Central:			
	70&2½%	60%	40&7½%
Western and Southern:			
	65&10%	50&10&2½%	40&5%
	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
So. Western			
	62½&7½%	50&5%	40&2½%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	5	6	8
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined.25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair.....25@26¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian.....lb., *A, 18¢; B, 16¢*
Common India.....lb. 10@10½¢
Cotton Sash Cord, Twisted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: ₱ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ₱ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ₱ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid, Italian, 16¢; Russian, 14¢; India.....12 ¢
Braided India.....18 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, per lb., Drab Cotton, 40¢; Italian Hemp, 40¢; Linen, 55¢; White Cotton or Spot....35 ¢
Massachusetts, White.....₱ lb 30 ¢
Massachusetts, Drab.....₱ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr. 6@6½¢
Cases, 100 gro., $5.00 at factory.

D. M. Steward Mfg. Co.:
Genuine, Per gro. Round Pencil, $2.25; Square Pencil, $1.75; Flat Crayon, $2.50; Metal Workers' Crayon, $3.00; Rolling Mill Crayon, $3.00.
Compo. Per gro. Round Pencil, $1.50; Square Pencil, $1.50; Flat Crayon, $1.50; Metal Workers' Crayon, $2.50; Rolling Mill Crayon, $2.50; Railroad Crayon, $4.00; Compo. Crayon, $4.00.
} Case lots, 50&20%. Case lots, 20%.

Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6 25@25&7½%

No. 202, $1.50.....40&7½%
Dixon's.....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ₱ doz. $24.00.....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—

All Iron, Cheap..*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers, ₱ doz., $6.25
Perfection Post Hole Diggers, ₱ doz.....$8.25
Split Handle Post Hole Diggers, ₱ doz. $7.25
Kohler's, ₱ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills..33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's, 40%; Weston's..40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn, Handles, 65%; No. 86, 75%; Victor, 55%; Defiance..70%
Swan's:
Nos. 7365 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80&2½%	70&7½%	40&10%
Central:			
	75&10&7½%	70%	40&7½%
Western and Southern:			
	70&20&7½%	60&15&2½%	40&5%
So. Western:			
	70&20%	65&2½%	40&2½%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Gauge.....60&10%
No. 26.....50%

No. 2½.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—

Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—

	4 to 46	5½ to 220	Flour.
Kegs	*lb.* 5 ¢	5½ ¢	3½ ¢
½ Kegs	*lb.* 5¼ ¢	5¾ ¢	3¾ ¢
¼ Kegs	*lb.* 5½ ¢	6 ¢	4 ¢
10-lb. cans,			
10 in case	6½ ¢	7 ¢	6 ¢
10-lb. cans, less			
than 10	10 ¢	10 ¢	8 ¢
Less quantity	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....40&10%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz	$3.25	3.75	4.25	4.75

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Stowell's Giant Grindstone Hanger.. ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 50&10&10%; Light.....60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15

Extra 5@12½%

Gates, Molasses and Oil—

Stebbins' Pattern.....80&10%

Gauges—

Marking, Mortise, &c...50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&18@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; *2,* $2.30
Spike, Metal, No. 1, $4.00; *2,* $4.30
Nail, Wood Handled, No. 1, $2.50; *2,* $2.60
Spike, Wood Handled, No. 1, $4.30; *2,* $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—

Common Grade....*gro.* $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ₱ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 }

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web.....45%
Jute Rope.....45%
Sisal Rope.....33⅓%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c.....60&10@60&10&5%
Hoe, Rake, &c......45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—

Atkins'.....40%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro.* $2.50@$3.00
Brad Awl.....*gro.* $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; *Not Varnished*...65@75¢
Plane Handles:
*Jack, doz. 30¢; Jack, Bolted.*75¢
*Fore, doz. 45¢; Fore, Bolted.*90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.... ₱ gro. $0.85@$1.50

Hangers—

NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Allith Mfg. Co.:
Reliable, ₱ doz., No. 1, $8.00; No. 2.....$9.60
Allith No. 3, ₱ doz.....$21.00
Allith Adjustable No. 6, ₱ doz.$30.00
Reliable Parlor Door, ₱ set....$2.50
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered.....60&2%
Special.....70&5%
Lawrence Bros.:
Advance and Sterling.....60&10%
Cleveland and Peerless.....75%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 39, 41, 43, 70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B, D. No. 17, $1.25; F. D. No. 120, $2.10; No. 121, $2.25; No. 150.....$2.35
Safety Underwriters F. D. No. 101.....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B, D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60&10%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135.....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas, 60%; Freight Car Door.60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic, 60%; Rex Hinge Door.60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door, 50&10%; Railroad, 50&10%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door.....50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle.....70%
Climax Anti-Friction.....50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....₱ gro. $9.00
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ₱ doz. net.....$4.50

Joist and Timber—

Lane Bros. Co.....30%

Hasps—

Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ₱ doz..50%

Hatchets—

Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ₱ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5.....75&10&5%
Buffalo Gravity Lockin , Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'tches.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....*doz.* ...@$2.00
Without Latch...*doz.* ...@$1.60
Reversible Self-Closing:
With Latch.....*doz.* ...@$1.75
Without Latch...*doz.* ...@$1.35
Western:
With Latch.....*doz.* $1.75
Without Latch.....*doz.* $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets.

Nos.	1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback, Cast Iron...$6.50@$7.00
Non-Holdback, Cast Iron$6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge.....₱ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k, ₱ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Ex. Heavy T..70&10%

Extra 10&5@10&10%

Screw Hook and Strap. { *6 to 12 in.* ..lb. 3¾¢ ; *14 to 20 in.* ..lb. 3½¢ ; *22 to 36 in.* ..lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
Per doz.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 66⅔%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe.₱doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₱ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....*80&10@..%*
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Hush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 1 to 10.....*lb. 3 @3½¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*65*	*62*	*75*	*72*
Tin'd Tops	*70*	*67*	*80*	*77*

New England Pressing..lb. 3¾@4¢

Pinking—
Pinking Irons.....*doz.60¢*

Irons, Soldering
See *Copp.ers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Covert's Saddlery Works:
Daisy.....60&10%; Victor, 60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz.$5.75@6.00
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro.$1.25@$1.50*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....50%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz.$4.25@4.50
Lift Tubular, No. 0.....
doz.$4.75@5.00
Hinge Tubular, No. 0.....
doz.$4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ₱ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—
Wire Clothes, Nos. | *18* | *19* | *20*
100 feet..... | *$2.25* | *2.00* | *1.75*
75 feet..... | *$1.75* | *1.55* | *1.10*
Anniston Waterproof Clothes, 50 ft., ₱ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....*75&10&5@80&5%*
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 62½%; Crescent, 50&10%; Iron, 62½%; Window Ventilating, 60%; Robinson Pat. Ventilating Sash Lock, 40%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.....
₱ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$54.00
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$30.00

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Apple-wood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list..
50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

12	*14*	*16*	*18-in.*
High Grade....	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—
Wire Nails and Brads, Miscellaneous.....*85&10@85&10&5%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	26	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%

Western.....₱ lb 8½¢
Jobbers' Special Brands.....
per lb .9@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd	*.55*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*.. 1.10*	*1.10*	*1.10*	*..*	*gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped..
4.90@5.00¢
Hexagon, Blank or Tapped..
5.30@5.40¢
Square, Blank, C. & T.5.20@5.30¢
Hexagon, Blank, C. & T..
5.90@6.00¢
Hot Pressed:
Square, Blank.....*5.10@5.20¢*
Hexagon, Blank.....*5.50@5.60¢*
Square, Tapped.....*5.00@5.10¢*
Hexagon, Tapped.....*5.40@5.50¢*

Oakum—
Best.....*lb. 6¼@6½¢*
U. S. Navy.....*lb. 5¾@6¢*
Navy.....*lb. 4½@5¢*
Plumbers' Spun Oakum..*2½@3¢*
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*70@70&5%*
Zinc.....*70@70&5%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50&10%
Stowell's Sprague.....₱ doz. 35@45¢
Vim Tin Shear and Can Opener, ₱ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*17@22¢*

Rubber—
(Fair quality goods.)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ₱ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper
Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.6¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.....*8¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.....*7¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll.....
35@40¢
Medium weight, 30 lbs. to roll.....
40@45¢
Heavy weight, 40 lbs. to roll..
56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$18.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 300 sq. ft.), ton.....
$32.50@35.50
2 ply, roll 108 sq. ft.....*55¢*
3 ply, roll 108 sq. ft.....*75¢*
Slater's Felt (roll 500 sq. ft.)..*70¢*

Sand and Emery—
Flint Paper and Cloth..*50&10@60%*
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..*50&10@60%*

Parers— Apple—
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Bonanza Improved.....each $6.50
Daisy.....₱ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
Little Star.....₱ doz. $5.00
New Lightning.....₱ doz. $7.00
Reading 72.....₱ doz. $3.25

Reading 78.....per doz. $6.25
Rocking Table.....per doz. $6.20
Turn Table '98.....per doz. $6.00
White Mountain.....per doz. $5.00

Potato—

Saratoga.....per doz. $7.00
White Mountain.....per doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899.....75%
Cronk's Handled Garden Mattock, per doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass.....60@60&10%
Iron, list Nov. 14, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in..50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—

Consumers, Carloads.

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
⅛ & ¼ in.	71%	55%	63%	52
⅜ in.	73%	59	70%	56
½ in.	75%	63%	72½	60
¾ to 6 in.	79%	69%	76½%	66½%
7 to 12 in.	74%	59%	71½%	56

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
*Maryland, Delaware, E. Pa.*73%
West. Pa. and West Va.....75%
Virginia.....76%
Ohio, Michigan and Ky.....75%
Indiana.....77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual......40&10%
Bench, Second qual......50&10%
Molding.....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's.....60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding.....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union.....60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Union.....60%

Plane Irons—

Wood Bench Plane Irons.....
25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....per doz. $8.50

Plates—

Felloe.....lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), per doz. $2.00.....50%

Pliers and Nippers—

Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$3.00	$3.75

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers.....40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Lodi, 50%; Paragon, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, per doz. No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,....lb. 10¢
½-lb. papers.....lb. 9@10¼¢
¼-lb. papers.....lb. 9¾@11¢

Pokes, Animal—

Ft. Madison Hawkeye.....per doz. $3.25
Ft. Madison Western.....per doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; per doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; per doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), per doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, per doz. 50¢; per gro. $4.50; ½ lb boxes, per doz. $1.25; 1 lb boxes, per doz. $2.25.
U. S. Liquid, 8 oz. cans, per doz., $1.25; per gro., $12.00.
Barkeepers' Friend Metal Polish, per doz., $1.75; per gro., $18.00.
Wynn's White Silk, ½ pt. cans, per doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, per lb 10¢
Black Eagle, Liquid, ½ pt. cans, per doz. 75¢
Black Jack Paste, ¾ lb cans, per gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, per gr. $5.75.....10%
Dixon's Plumbago.....per lb 8¢
Fireside.....per gr. $2.50
Gem, per gr. $4.50.....10%
Japanese.....per gr. $3.50
Jet Black.....per gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. per doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....per doz. $1.00
Black Silk, 5 oz. box.....per doz. $0.75
Black Silk, ½ pt. liq.....per doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled.....40%
Tinned.....30%

Powder—

In Canisters:
Duck, 1 lb.....each 15¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk).. 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, per doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz., $12.00..33⅓&10%
Morrill's No. 1, Nail Puller, per doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, per doz., No. 2, $6.00; No. 3, $5.50.
Giant No. 1, per doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, per doz., 75c.: per gro., $6.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	1	1¼	1½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz.	$0.16	.19	.25 .30
Inch	1¾	2	2¼ 2½
Side, doz.	$0.25	.40	.55 .60
Inch	1½	1¾	2 2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in......16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢

Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... per doz. 50
Grand Rapids All Steel Noiseless..50%
Ideal.....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....per doz. $6.75
Flint & Walling's Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good.....
doz. 50@75¢
Spring, single tube, good quality.....$1.75@2.00
Revolving (4 tubes).....
doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Lodi, 50%; Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., per doz., $1.44.....60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron.....
2½@3¾¢
Sliding Door, Wrought Brass, 1¼ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track, per ft., No. 1, 5½¢; No. 2, 7¢; No. 3.....12¾¢
Cronk's: Double Braced Steel Rail..per ft. 2¾¢
O. N. T. Rail.....2¼¢
Griffin's:
xxx, per 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, per 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, per 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., per 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....per 100 ft. $4.00
Lawrence Bros.: per 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., per 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, per ft., 11¢.50%
None Better.....per ft. 3¾¢
Standard.....per ft. 4¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-8 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, per ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 4, $3.25; 49, No. 2, $3.50.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard.....60%
Stowell's:
Cast Rail.....per ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....per ft. 3¢
Wrought Bracket, 1¼ x 5-16..per ft. 1¢
Swett's Hylo, per ft. 11¢.....60%
P. L. B. Steel Rail.....per 100 ft. $3.00
No. 0, 1 x 3-16.....per 100 ft. $2.75

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, per doz., net.....$4.25
Cronk's:
New Champion Garden, per doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, per doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....60%
Queen City Lawn, per doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, per doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....per doz. $3.45
Lawn Queen, 24-tooth.....per doz. $3.60
Paragon, 20-tooth.....per doz. $2.75
Paragon, 24-tooth.....per doz. $3.00
Steel Garden, 14-tooth....per doz. $2.40
Malleable Garden, 14-tooth, per doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Boras—I C.....60%
Fox Razors, No. 42..per doz. $20.00
Fox Razors, No. 44..per doz. $20.00
Fox Razors, No. 82, Platina... per doz. $25.00
} Discount 40%
Red Devil.....50%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Kampfe Bros.:
Star Safety.....25%
Star Interchangeable.....25%
Star Safety Corn.....25%
Silberstein.....40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed.....70&10%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic.....$3.45
Hammerless.....$4.00

Riddles, Hardware Grade

16 in......per doz. $2.50@$2.75
17 in......per doz. $2.75@$3.00
18 in......per doz. $3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper 2 in., per doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron.....
doz. 50@55¢
Hill's Ringers, Malleable Iron..
doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper.....45@45&5%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50.....$1.09
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..per doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....per doz. 65¢
Hinge Adjustable Stay.....per doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure.....lb., 12½¢
Sisal, 7-16 in. diam. and larger:
Pure.....lb. 9½¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....lb., 8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....lb., 8¢
Pure.....lb. 9½¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed.....lb. 8¢
Pure.....lb. 9½¢
Cotton Rope:
Best, ¼-in. and larger.16½@18¢
Medium, ¼-in. and larger.
15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up.lb. 7¢
Thread No. 2, ¼-in. & up.lb.6½¢
Old Colony Manila Transmission Rope.....per lb 17½¢

Wire Rope—

Galvanized.....37½&2½%
Plain.....45&2½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute.....45%
Sisal.....33⅓%
Covert Saddlery Works.....60&5%

Rulers, Desk—

Stimpson & Son:
Boxwood and Maple.....30&10%

Rules
Boxwood .....60&10&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood .....60@60&10%
Flexifold .....27½&10&10&2½%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Combination .....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....40%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band .....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts.....50%
Narrow Crosscuts.....55%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 90, 9, 16, d100, D9, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades.....25%
Keystone 40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—
Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Sealers, Fish—
Covert's Saddlery Works.....60&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. .....doz. $5.50
Two Platforms, ¼ oz. to 8 lbs. .....doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales.....30%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2.....40%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@25%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.50%

Scrapers—
Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.60@2.85
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech..doz. 30@30&5%
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99.....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—
Standard List.....75&5@75&10%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50%
Swett Iron Works.....75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—
Set (Iron).....80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75%
Hex. Hd. Cap.....75%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass....85 &10@..%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Grass, No. 1, Plain....	*$6.25@6.75*
Clipper, Bronzed Webb.	*$6.50@7.00*
No. 3 Clipper, Pol'd Webb..	*$6.75@7.25*
No. 6 Clipper and Solid Steel,	*$7.00@7.50*
Bush, Weed and Bramble, No. 2	*$6.50@7.00*
Grain, No. 1.....	*$8.25@8.75*
Bronzed Webb, No. 1..	*$8.50@9.00*
Nos. 3 and 4 Clipper, Grain..	*$8.75@9.25*
Solid Steel, No. 6.....	*$9.25@9.75*

Seeders, Raisin—
Enterprise .....25@30%

Sets—Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel.....℔ doz sets $9.00

Sets, Nail—
Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ℔ gro.$12.40
Mayhew's .....℔ gro. $9.00
Snell's Cor'gated, Cup Pt...℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt.℔ gro. $7.50

Rivet—
Regular list.....75@75&10%

Saw—
Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 25%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.00.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut.....℔ doz. $8.00
Royal, Hand.....℔ doz. $4.50
Taintor Positive.....℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 20.....
℔ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co.....75%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz.....$1.50
Mounted Kitchen Sand Stone, ℔ doz.....$1.50
Natural Grit Carving Knife Hones, ℔ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz.....$1.50
Quick Edge Pocket Knife Hones, ℔ doz.....$2.50
} 3¢

Skate—
Smith & Hemenway Co.....20%

Shaves, Spoke—
Iron .....doz.$1.10@1.25
Wood .....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—
	7	*8*	*9 in.*	
Cast Iron..				
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good ...	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap ..	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fail quality, Nickel..75@7..&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—
Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—
Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00.....25%
Disston's Pruning Hook, ℔ doz. $12.00.....25%
John T. Henry Mfg. Co.: Pruning Shears, all grades....30&10%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—
Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....25%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag....$1.85
Drop, B and larger..... per 25-lb. bag, $2.10
Buck, 25-lb. bag.....$2.10
Chilled, 25-lb. bag.....$2.10
Dust, 25-lb. bag.....$2.30

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle.....$2.75@$3.00
Wood and Mail, D. Handle, $3.25@$3.50

Sieves and Sifters—
Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@13.50
Buffalo Metallic Blued, R. M. Co., ℔ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00.....20%

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....40%
20 x 40 to 24 x 50 in.....35%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron.....80@80&10%
Steel .....40@40&10%

Slates, School—
Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless..60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German .....40@40&10%
Covert Mfg. Co.:
Derby .....30&2%
High Grade.....45%
Jockey 35%
Trojan 45%
Yankee .....30&2%
Yankee Roller.....30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—
German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—
Teas .....per gro. 45@50¢
Tables.....per gro.$0.50@$1.00

Springs—Door—
Chicago (Coil).....40&10%
Gem (Coil).....20%
Pullman (Coil).....25%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....℔ doz. $1.10

Carriage, Wagon, &c.—
1¼ in. and Wider:	*Per lb.*
Black	*4@4¼¢*
Half Bright	*4@4¼¢*
Bright	*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1¼ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—
Enterprise .....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24.....30%
Pfeuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros.'.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—
Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—
Enterprise .....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1901 list: ℔ lb.
Gem Corundum Oil, Double Grit.60¢
Gem Corundum Axe, Single or Double Grit.....60¢
Gem Corundum Slips.....60¢
Gem Corundum Razor Hones....50¢
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5¼ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips.....90¢
Rosy Red Slips.....80¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
} 33⅓%

Hindostan No. 1, R'g'lar, ℔ lb 8¢
Hindostan No. 1, Small, ℔ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots ℔ gro. $9.00
One gross or more ℔ gro. $7.20
Lots of 10 gross or more ℔ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S. ℔ gro. $6.00
Extra Indian Pond S. S. ℔ gro. $7.50
No. 1 Indian Pond S. S. ℔ gro. $7.00
No. 2 Indian Pond S. S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Quick Cut Emery ℔ gro. $10.00
Pure Corundum, ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots 25&20%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket doz. $1.60
Bullard, ℔ doz. $4.00
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00 20%

Strops, Razor—

Star Diagonal Strop 25%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated $72.00
Sheraton, Roller Bearing, N'kel. $60.00
Ye Mission, Roller Bearing, Oxidized Coppered $36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled $36.00
National Queen, Roller Bearing, Fancy Veneers $27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel. $24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel. $22.00
Monarch, Roller Bearing, Jap. $20.00
Perpetual, Regular B'r'gs, N'kel. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled $36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned $33.00
Auditorium (28 in. case), Roller Bearing, Nickeled $54.00
Mammoth (30 in. case), Roller Bearing, Nickeled $60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire ℔ doz $25.00
Model A, Sterling ℔ doz. $25.00
Model B, Sterling, Nickeled ℔ doz. $23.00
Model B, Sterling, Japanned ℔ doz. $21.00
Model C, Sterling ℔ doz. $21.50
Model D, Sterling ℔ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks 90¢40@—%
American Cut Tacks 90¢40@—%
Swedes Cut Tacks 90¢40@—%
Swedes Upholsterers' 90¢50@—%
Gimp Tacks 90¢50@—%
Lace Tacks 90¢40@—%
Trimmers' Tacks 90¢40@—%
Looking Glass Tacks 65@—%
Bill Posters' and Railroad Tacks, 90¢50@—%
Hungarian Nails 85@—%
Finishing Nails 70¢10@—%
Trunk and Clout Nails 80¢@—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks 90¢5 or 6 tens

See also Nails, Wire.

Tanks, Oil— Each.

Emerald, R. M. Co. 30-gal. $3.40
Emerald, R. M. Co. 60-gal. $4.25
Queen City, R. M. Co. 30-gal. $3.65
Queen City, R. M. Co. 60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 50@—%
Patent Leather 25@30&5%
Steel 33 1-3&5%
Chesterman's 25@25&5%
Eddy Asses' Skin 40&10@50%
Eddy Patent Leather 25@30&5%
Eddy Steel 40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list 35@35&5%
Pocket 35@35&5%
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Miniature—

Smith & Hemenway Co.'s 35%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75@75&5%
Newhouse 45@45&5%
Hawley & Norton 65%
Victor 70&10%
Oneida Community Jump 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I. 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern ℔ doz. $18.50
McKinney Trucks each $10.00
Model Stove Trucks ℔ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	$4.25	4.75	5.25

Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	BC.	B.
No. 9, ¼ and ½-lb. Balls	.22	@24¢
No. 12, ¼ and ½-lb. Balls	.18	@20¢
No. 18, ¼ and ½-lb. Balls	.16	@18¢
No. 24, ¼ and ½-lb. Balls	.16	@18¢
No. 36, ¼ and ½-lb. Balls	.15	@17¢

Chalk Line, Cotton ½-lb. Balls 25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality 11½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 13@14¢
American 3-Ply Hemp, 1-lb. Balls 13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 9¢
India 3-Ply Hemp, 1-lb. Balls. 9¢
India 3-Ply Hemp, 1½-lb. Balls. 7½@8½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 9½@10½¢
Mason Line, Linen, ½-lb. Bls. 46¢
No. 26½ Mattress, ¼ and ½-lb. Balls 87¢
Wool, 3 to 6 ply B 7¢; A 7½¢

Vises—

Solid Box 60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting 25@25&5%
Tiger Machinists' 40%
Fisher & Norris Double Screw 15&10%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch 50%
Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel.. 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30 25%
Perfection Saw Clamps, ℔ doz. $4.80
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series 60&5%
No. 870 40%
Williamson Mfg. Co. Double Swivel Combination Pipe 40&5%

Wads—*Price per M.*

	Dis. 15%
B. E., 11 up	.60¢
B. E., 9 and 10	.70¢
B. E., 8	.80¢
B. E., 7	.80¢
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50

Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground 65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 60%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	.45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles. 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame. $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 50&10@80&10&10%
Patent 90@90&5%

Coil:	¼	½	1¼	1½ *Inch.*
	10¢	11¢	12¢	13¢ *per box*

Iron or Steel—

Size bolt	5-16	¾	½	⅝	¾
Washers	$5.60	4.70	3.40	3.20	3.00

The above prices are based on 5.80¢ off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4 40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 50&10%

Wedges—

Oil Finish lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co. 40%
Covert's Saddlery Works 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $27.50@$28.00
Southern Territory $20.00@$23.00
Western and Central Districts $23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80%
10 to 18 80&2½%
19 to 26 80&7½%
27 to 36 80&2½%
Galvanized:
6 to 9 75&5%
10 to 14 75&7½%
15 to 16 72½&10&2½%
19 to 26 75%
27 to 36 72½%
Coppered:
6 to 9 75&5%
10 to 14 75&7½%
15 to 18 72½&10&2½%
19 to 26 75&10&5%
27 to 36 75%
Tinned:
6 to 14 75&10&2½%
15 to 18 75&7½%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&5@60&10&5%
Brass, list Feb. 26, '06 15%
Copper, list Feb. 26, '06 25%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24 '03 90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks 85@—%

Wire Cloth and Netting—

Galvanized Wire Netting 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3½¢
No. 6 Mesh, sq. ft. 3½¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10&5@80%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S 40%
Adjustable S Pipe 40%
Bemis Pipe 60%
Briggs Pattern 40%
Combination Black 40&5%
Combination Bright 40%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes', Genuine Hammer Handle 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ℔ doz. $6.25
Elgin Rethreading Attachment, one die, ℔ doz. $6.25
Elgin Extra Dies, ℔ doz. $3.00
Elgin Extra Jaws, ℔ doz. $1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz. $2.10
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. 50&5%
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz. $0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ℔ doz. $48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $7.90@8.15

For the Table of "Current Metal Prices" see the First Issue of Every Month.